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January 6, 1997

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THE NEW NEWBRIDGE
Company Chairman and CEO Terry Matthews looks beyond the WAN. *Page 8.*
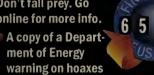

No cure for virus hoaxes

By Todd Wallack

I
t just might be the most persistent breed of computer virus on the Internet.

No, it won't crash your network, bring down any workstations or destroy valuable data. But hoaxes such as Good Times and Penpal, which warn readers that a rogue E-mail message with those words in the subject could crash their hard drives, do eat up countless hours as naive end users call their IS departments in a panic.

"It's almost like a text virus
See Hoax, page 14

Don't fall prey. Go online for more info.

6568

- A copy of a Department of Energy warning on hoaxes
- More than you'll want to know about the history of hoaxes
- IBM hype alerts on alleged phone viruses

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Communicator quandary

Netscape browser revamp lacks modular install, forces customers to load E-mail, discussion and authoring tools.

By Carol Sliwa

Those planning on upgrading to Netscape Communicator could be in for a bit of a shock. Besides a browser, the new software comes with a full E-mail client, Web authoring tools and a group discussion application, whether the customer wants them or not.

The monolithic nature of the release leaves IS managers, who have likely already standardized on mail and groupware packages, in a quandary. What do they do with all this redundant software?

The minimum installation consists of the Navigator browser, Messenger mail client, Composer Web authoring tool and Collabra group discussion software. And there's currently no way to disable any of those elements, Netscape Communications Corp. acknowledged.

"In order to get [Netscape's]
See Netscape, page 45

Netscape's Communicator features a floating task bar (lower right of each screen) for switching between its components. Shown here are Navigator, Composer and Messenger.

ADSL speeds are not all they're cracked up to be

By Tim Greene

If you believe everything you hear about Digital Subscriber Line (DSL) technology, you probably think that any day now you'll get Internet access fast enough to melt phone wires.

But the fact is there is a big gap between what is happening in the labs and the real world, carrier trials show.

Vendors talk about Asymmetric DSL (ADSL) supporting 8M bit/sec over residential-grade phone lines, but planned service rollouts will only support speeds from 128K to 1.5M bit/sec.

"We're just beginning to understand what we have to tackle," said Flynn Nogiueria, marketing director overseeing GTE Corp.'s DSL trials.

Carrier trials so far yield two key results: The quality and length of actual local loops can limit DSL bandwidth, and carriers need an architecture that not only works, but also is inexpensive to provision and maintain.

While carriers wait for ADSL
See ADSL, page 14

WHERE'S MY DSL?

To learn more about DSL technology and service plans, check out our WAN **Special Focus**, page 20.

GridNet preps global intranet service with a security twist

By Denise Pappalardo

The big guns are talking about it, but it might just be little-known GridNet International that offers the first truly global intranet service.

MCI Communications Corp. and Sprint Corp. have announced but not delivered such an offering. PSINet, Inc. has one, but it only serves three countries.

INTERNATIONAL INTRANETS

The GridNet service, set for availability next month, will immediately serve 50 countries, according to company officials.

And the WorldCom, Inc. subsidiary plans a security twist that eliminates the need to keep track of pin numbers and pass codes. In their place? The human hand.
See GridNet, page 14

Cisco readies Catalyst switch for the masses

By Jim Duffy
San Jose, Calif.

Cisco Systems, Inc. is getting ready to deliver a junior edition of its Catalyst 5000 LAN switch.

The new Catalyst 5002 is a two-slot version of Cisco's popular five-slot Catalyst 5000 that can be used in desktop, workgroup or backbone environments. It is designed for customers needing the flexibility of the 5000 but at a lower port density and cost.

"They're setting their sights lower and lower," said Skip MacAskill, senior research analyst for Gartner Group, Inc. "They saw a little bit of a gap between the desktop and the wiring closet."

Indeed, the 5002 is the new entry point into Cisco's Catalyst 5000 switch family, and shares a common architecture, software and spare parts with the 5000 and the upcoming — but unannounced — Catalyst 5500. The 13-slot 5500, expected by mid-year, is said to sport three 1.2G bit/sec backplanes, token-ring and Gigabit Ethernet switching modules, a routing module.
See Cisco, page 45

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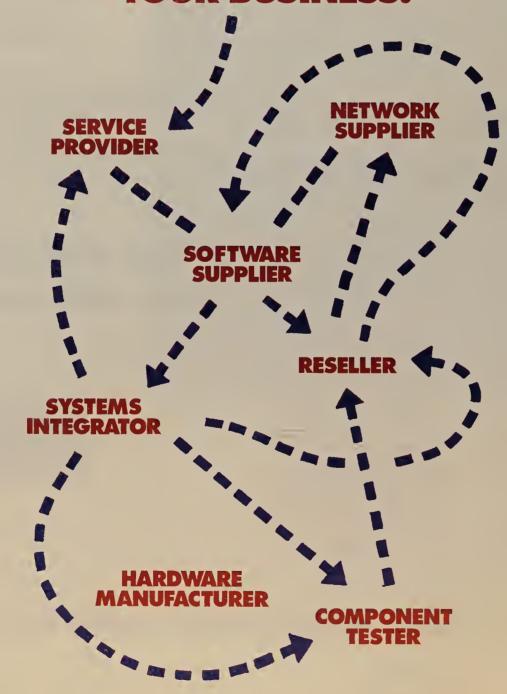
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NetworkWorldContents

January 6, 1997 Volume 14, Number 1

FEATURES

Rock-solid incentives: Prudential's bonus program puts a premium on training and incentives that keep staffers around to use what they've learned. **Page 31.**

TOM NORTON

Freeing up spectrum for wireless LANs

■ The Federal Communications Commission this week will consider final approval of a plan setting aside 350 MHz of free, unlicensed radio spectrum for a new category of terminal equipment suitable for schools and others seeking wireless LANs. The so-called NII/SuperNet devices would include PCs and laptops equipped with radio receivers to transmit data over short distances. This initiative has been championed by Apple Computer, Inc. FCC Chairman Reed Hundt has noted the difficulty of burrowing through thick classroom walls to install wired LANs, though the plan has caused some grumbling among carriers who have paid dearly for wireless licenses in recent years.

Frankenberg resurfaces

■ Former Novell, Inc. Chief Executive Officer Robert Frankenberg has resurfaced as a member of the board of directors of Caere Corp., a maker of optical character recognition and document management products. Frankenberg left Novell in August amid criticism that the network giant was late to jump on the intranet bandwagon.

Frankenberg

Spanning the Internet globe at lower rates

■ Netcom On-Line Communications Services, Inc. announced a partnership this week with AimQuest Corp. that will allow users to access Netcom's Internet service from around the world using AimQuest's Global Reach Internet Connection (GRIC) network. The GRIC is made up of Internet service providers from around the world. Netcom is the first national ISP to sign up with AimQuest. When Netcom users are traveling outside of the company's service area, they can dial in to the local GRIC ISP's network instead of making an international or long-distance call. Although Netcom's pricing was unavailable at press time, GRIC partners have agreed to service charges that range from $4 to $6 per hour for most international calls, said Christophe Culine, vice president of sales and marketing at AimQuest.

Nortel spins out Entrust

■ Northern Telecom, Inc. last week spun out its business unit responsible for the Entrust public-key encryption software. Nortel's Secure Networks unit will now be called Entrust Technologies, Inc. While it will still be majority-owned by Nortel, several venture capital and investment banking firms have acquired partial stakes in the firm. John Ryan, formerly Nortel's vice president for multimedia and Internet solutions, will serve as Entrust's interim chief executive officer.

Ryan

AT&T lets NCR go

■ AT&T last week said it has completed its spin-off of NCR Corp. with the distribution of more than 100 million shares of NCR common stock to AT&T shareholders. AT&T announced plans in September to break itself into three publicly traded companies.

Java on the standards track

■ Sun Microsystems, Inc.'s JavaSoft, Inc. unit will take an important, though still preliminary, step this week in making Java a true industry standard. The Mountain View, Calif., business unit is hosting a meeting of the International Standards Organization to talk about the process of turning the Java language and some related technologies over to the ISO, or other industry bodies. JavaSoft Chief Technology Officer Jim Mitchell is in charge of that effort, which will unfold over the next 12 to 24 months, according to a JavaSoft spokeswoman. There are likely to be several such meetings to map out what would be given to which group and when. Only then, the spokeswoman said, would JavaSoft be able to announce a road map for the Java standard.

What's NeXT for Apple?

By John Robinson
San Francisco

For Apple Computer, Inc. and its ever-faithful brethren, it was an announcement of biblical importance that shook the company to its core: "Apple buys NeXT; Jobs comes home."

Now that the dust has settled, Apple this week is expected to use the MacWorld Expo here to convince its followers that last month's $400 million acquisition of NeXT Software, Inc., and with it the return of Apple cofounder Steven Jobs, will pay off for the company and its customers.

While Apple was tight-lipped about what Chairman and Chief Executive Officer Gilbert Amelio will say during his keynote address, observers said the message should be that Apple will move quickly to blend its technology with NeXT's. They added that Apple cannot afford to dilly-dally in light of Microsoft Corp.'s growing desktop and server strength, and the emergence of network computers.

Specifically, Apple must focus on the following areas:
● Taking advantage of the Nextstep operating system's multiplatform support to deliver a powerful set of desktop and server machines.
● Using NeXT's object-oriented application development tools to strengthen Apple's intranet offerings.
● Ensuring backward-compatibility of applications built under a NeXT-based Macintosh operating system with older versions.

The NeXT deal gives Apple as many hardware development opportunities as software possibilities, said Rob Enderle, an analyst with Giga Information Group in Santa Clara, Calif. The Nextstep operating system runs on Pentium processors, among others, and Apple promises a version for the PowerPC, as well. Enderle expects Apple will quickly realize, if it has not already, that the Intel support could open opportunities for its server business.

"They will have to decide if they want to develop [new] servers that run on a Pentium or PowerPC, or both," Enderle said. He added that with a new NeXT-based operating system

The Nextstep operating system runs on Pentium processors, among others, and Apple promises a version for the PowerPC, as well.

on Pentium-based network clients, Apple could create a link to a server running Windows NT.

An Apple spokesman said that while the new version of Apple's operating system will most likely include support for Pentium chips, the PowerPC will remain Apple's platform of choice.

Either platform would provide a solid foundation for the application development and intranet offerings Apple expects to deliver as a result of the NeXT acquisition, the spokesman said.

"One of the reasons we chose NeXT was to boost our application de-velopment side. . . and strengthen our intranet [offerings]," he said. Among the highlights for Apple is NeXT's WebObjects software, server-side software that can be used to link Web servers to back-end corporate data and applications.

Many Apple customers are excited about the development opportunities the NeXT software will afford them, but expressed some concern that applications will not be backward-

compatible to previous Macintosh operating system versions.

John Wimer, director of operations for Norian Corp., a pharmaceutical company in Cupertino, Calif., oversees an 80-node Macintosh network devoted mostly to file and print

Apple's *Amelio will deliver the keynote address at the MacWorld Expo.*

services. With a large investment in applications and immediate plans to build a corporate intranet, the portability of new applications built with NeXT technology is of utter importance.

"At least for the PowerPCs, there seems to be a pathway to port [new] applications to the platform. . . and we are moving mostly to PowerPC machines," Wimer said.

He added that the acquisition is not going to stall Norian's schedule to implement an intranet by the third quarter. "Generally, we are excited about the deal," he said. ■

Expo to feature Apple, Microsoft products

At MacWorld Expo in San Francisco this week, Apple Computer, Inc. will move forward with several new technologies and products, despite speculation that the company's impending new operating system will force a retooling of some product lines. Among the highlights:
● A new version of AppleShare, the company's file and print network technology, that uses standards-based TCP/IP to allow non-Macintosh computers to gain access to data and applications stored on MacOS servers. With new Web, E-mail and File Transfer Protocol support, Apple is positioning the software for small businesses at the departmental and workgroup level.
● An update to MacOS System 7.5.5. Version 7.6 incorporates a new Installer to simplify installation and a new Extension Manager that makes it easier to enable or disable extensions.
● MacOS Runtime for Java 1.0, a version of Sun Microsystems, Inc.'s Java Virtual Machine and run-time environment for Macintosh and MacOS-compatible systems. It includes a player that allows users to view Java applets and applications, in addition to developer APIs.
● Apple Club, a new Web-based subscription service that provides customers with software updates, utilities, patches and extensions for download at discounted prices.

Also at the conference, Microsoft Corp. hopes to prove its commitment to the Macintosh platform once and for all by unveiling the production version of Internet Explorer 3.0 for the Macintosh.

In addition, the company will announce a Macintosh version of its FrontPage Web page authoring product, which has previously been available only for the Windows platform.

— John Robinson and IDG News Service

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Cascade buys Sahara

Sahara gear pushes ATM to edge of carrier networks.

Q&A Cascade Communications Corp. last week bought start-up Sahara Networks, Inc. for a stunning $212 million, even though Sahara will not deliver its ATM access concentrators until the second quarter.

The SA-100, SA-600 and SA-1200 units extend multiple service interfaces — circuit switching, Ethernet, frame relay and video — to the customer from a carrier's ATM network. Sahara President and Chief Executive Officer Jonathan Reeves and Cascade founder and Executive Vice President Desh Deshpande talked about the deal with *Network World* Senior Writer Tim Greene.

What makes Sahara worth $212 million?

Deshpande: They're worth a lot more than that, we hope. Part of the reason we pay such a premium for companies like this is because this is what all of our customers are looking for. Our customers start off with a frame relay base and augment that with an ATM backbone to scale the frame relay network. They are also beginning to reach out to customers with ATM services.

Cascade's *Deshpande says this acquisition provides what his customers want.*

The next thing they want to do is attach something to the end of the ATM service so they can offer a bunch of other services with the ATM pipe that comes to the customer premises. We're buying Sahara because we know that's what our customers want. There's not a lot of speculation about whether the customers need this.

What makes your customers think that users want these services?

Deshpande: The key is the transition from private to public networking. Today's private networks are built primarily to improve the productivity of a company. They are MIS-type of networks.

In the future, these networks will be built so they can do electronic commerce. They'll need to reach out and touch every-

body in the world.

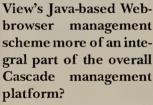What is lacking is the robustness and a lot of the end-to-end quality of services in those networks. What this acquisition does is bring that capability to Cascade so we can offer users those services.

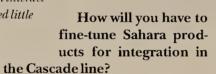**Why did Sahara put itself up for sale before it had a chance to bring a product to market?**

Reeves: What we saw there were all the other pieces other than what Sahara had. We see Cascade as perhaps the most dramatic influencer of the network of the regional Bells and interexchange carriers. Looking at Cascade's IP switching technology, IP Navigator, the CBX 500 ATM switch, the AX series of dial-up systems — what we saw here was a tremendous opportunity to combine forces.

Do you plan to make Sahara View's Java-based Web-browser management scheme more of an integral part of the overall Cascade management platform?

Deshpande: It definitely integrates into the Cascade management strategy. It's a very interesting way to manage products.

Sahara's *Reeves says the two companies' products will interact well and need little tweaking.*

How will you have to fine-tune Sahara products for integration in the Cascade line?

Reeves: Not much. Sahara-View network management was designed to provide quick and efficient integration, and Cascade View was designed with similar concepts in mind.

The products will work well together. We expect a key strength there.

Was this deal the reason Sahara didn't ship products on schedule last month?

Reeves: Yes.

Will the products be the same as announced by Sahara?

Reeves: Yes. The SA-100, SA-600 and SA-1200 platforms will each be marketed through Cascade. The capabilities will match along the lines of what has been described. ∎

Business profile

Introducing the new Newbridge

By Tim Greene
Herndon, Va.

Newbridge Networks Corp. eliminated any doubt about its joining the elite club of $1 billion network vendors with its purchase last month of UB Networks, Inc. The issue now is whether Newbridge can command the same respect and mind share that the other industry giants enjoy.

While Newbridge boasts a good reputation for its carrier-class ATM switches, it has so far failed to challenge Cisco Systems, Inc., Bay Networks, Inc., 3Com Corp. and the rest of the key LAN internetwork players.

Now, however, Newbridge is waging a direct assault.

"We're taking on Cisco by offering an alternative to backbone routing," said Newbridge Chairman and Chief Executive Officer Terry Matthews. "UB lets us get that alternative in front of a lot more customers more quickly."

Newbridge's plan is not all that different from those of other top-tier network hardware companies: Enter a second or third market outside the one in which they made their name. For example, Cisco was master of the enterprise router market but went on a LAN switch buying spree and then also bought ATM wide-area switch vendor Strata-Com, Inc. to have an impact in the carrier market.

Newbridge has already staked its claim in wide-area ATM switching, and now wants to be a player in the corporate enterprise network market, partly in

retaliation for Cisco's sortie into its territory. "Definitely, that was not a friendly move," a Newbridge spokesman said of the StrataCom deal.

Last year, Newbridge solidified its carrier presence, allying with core switch vendor Siemens AG to develop a platform for carriers to offer quality of service

> "I am absolutely convinced that there is a market window that has opened for multimedia and intranets requiring much more powerful routing on the basis of ATM."
>
> **Terry Matthews, chairman and CEO, Newbridge**

across their networks. If Newbridge could similarly solidify its presence in the corporate network market, then it could become a one-stop shop.

While UB was no longer among the very largest network equipment companies, it does have a healthy customer base that Newbridge could exploit, according to Farrokh Billimoria, a financial analyst with Hambrecht & Quist, LLC. "The question now is, can they execute?"

Breaking into the enterprise market is not easy, and Newbridge will be making its assault with the same weapon it has used for three years: Vivid. That is the company's switched routing system for connecting LANs over an ATM backbone.

Vivid has struggled, partly because when it was introduced in 1993, Newbridge anticipated a problem with router congestion that had not yet materialized in the real world. The products might well have been ahead of their time, Billimoria said. Network managers were solving their bandwidth problems with switched Ethernet and Fast Ethernet, while Vivid was mapping LANs over an ATM cloud, he said.

In addition, Newbridge may have promised too much from Vivid too soon, according to Rick Malone, principal with Vertical Systems Group, a consultancy in Dedham, Mass. "I just call that typical Newbridge. Once the product is in the field, people are disappointed because they don't have all the features that were announced. That led to a lack of credibility," he said.

But Newbridge is adamant about making Vivid succeed. One way it is trying to do that is by spinning out a series of affiliate companies, many of which build products that complement Vivid.

Still, Newbridge has much work to do in increasing VIVID's name recognition — even among its existing customers.

"I don't know anything about Vivid and haven't really ever heard of it," said Dan Howard, director of technical support at Express Scripts, Inc., a health care management company in St. Louis that uses Newbridge WAN gear and UB hubs. "When 1 think of Newbridge, 1 think of wide-area networks. It sounds like that might change, and they could become a one-stop place of LAN and WAN products." ∎

IBM reorganizes net hardware group to hit 'high-growth areas'

By Michael Cooney
Raleigh, N.C.

IBM is making a New Year's resolution to revamp, retool and — it hopes — restart its embattled Networking Hardware Division (NHD).

According to a memo issued by NHD general manager Lutz Hahne, the division broke into five business segments, effective Jan. 1, in an effort to concentrate better on vertical markets and "strategic high-growth areas."

NHD business segments include backbone/WAN, LAN

switching, remote access, network management and adapters. The division may also form a separate segment to handle products resulting from IBM's alliance with Cascade Communications Corp.

The idea is to give brand managers more autonomy over product development and enable them to speed new products to market. In addition, NHD will reduce its reliance on direct sales, reaching out to customers with new marketing tactics such

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LCD front panel	✓	✓		✓	✓
DTE data ports available	1, 2 or 4	1, 2 or 4	1 or 2	1, 2 or 5	1, 2 or 4+
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as 800-number sales and third-party resellers.

While still a multibillion-dollar business, NHD has taken its lumps over the past few years: The division has executed big layoffs, faced stiffer competition and struggled to keep up with customers' changing enterprise network needs.

Bringing it in-house

NHD has increasingly turned to partners to bolster its product portfolio even in markets where it once led. Now it is turning inward in an attempt to generate its own network heat.

Each NHD business segment will have its own manager and business plan (see graphic). According to the memo, executives heading up the new business segments should have specific plans ready by the middle of this month.

Analysts were skeptical about

whether the reorganization will pay off.

"The key to success will be how much autonomy IBM gives these managers," said David Passmore, president of the Decisys, Inc. consultancy in Sterling, Va. "IBM has toyed with this model before but never really implemented it an any effective way."

"IBM [wasn't] all that coherent with its [network] message to begin with, and to segment that message within a single division could be more confusing to users," said Thomas Nolle, president of the CIMI Corp. consultancy in Voorhees, N.J.

IBM also needs to make sure different NHD business segments build products that work together across SNA, TCP/IP and ATM nets, analysts said.

"IBM's strength has

been its ability to be a one-stop networking shop; it should build on that," Nolle said. "IBM can't afford to confuse its biggest users." ∎

IBM'S NETWORKING HARDWARE DIVISION GETS A NEW LOOK

Here's who will report to division general manager Lutz Hahne:

▶ **Michel Mayer**, general manager, Backbone/WAN Business Segment and the La Gaude lab.

▶ **William Conklin**, general manager, LAN Switching Business Segment. In addition, Conklin will oversee the Raleigh, N.C., networking site.

▶ **Jose Garcia**, general manager, Remote Access Business Segment.

▶ **Louise Terry**, general manager, Network Management Business Segment.

Hahne will act as the Adapters Business Segment manager for now. Other executives, such as Lee Roberts, general manager of networking marketing and sales, and Rick McGee, vice president of strategy and business development, will remain in their current positions.

In-Site

Bear, Stearns bullish on Magellan switches

By David Rohde
New York

In a move to extend its ATM production network nationwide, investment banking firm Bear, Stearns & Company, Inc. has deployed 24 Magellan Passport enterprise network switches from Northern Telecom, Inc.

Bear, Stearns' nationwide Passport installation, to be announced today, began nearly a year ago. The project has let Bear, Stearns migrate its legacy time-division multiplexer (TDM) net to frame relay, with plans to transition to ATM later this year.

Using Passport's frame relay-to-ATM internetworking capability, most Bear, Stearns remote offices now feed data traffic off a router via frame relay to the Passport switch. Passport then converts the traffic to cells and functions as an edge switch over Bear, Stearns' private ATM WAN, according to Mark Tharby, Nortel's director of Magellan enterprise marketing.

At the main data center site, Passport takes native ATM traffic off the LAN and is connected into Bear, Stearns' private OC-48 Synchronous Optical Network (SONET) metropolitan-area net (MAN) ring. The MAN uses General DataComm, Inc. and Bay Networks, Inc. ATM and Ethernet switches to connect users in Manhattan with a state-of-the-
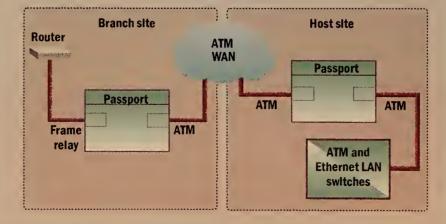
art data center in New Jersey.

Since Nortel's division serving carriers supplies Bear, Stearns' SONET multiplexers, the vendor had something of a leg up in competing for ATM WAN gear. "They were very happy with their SONET gear," Tharby said.

But Bear, Stearns also was interested in Passport's capability to ship delay-sensitive voice and video traffic over the same variable bit rate circuits as pure data traffic, Tharby said. It is expected to run simulation programs and other multimedia traffic over the circuits without the need for preallocated channel bandwidth characteristic of TDM nets.

Bear, Stearns is expected early this year to install additional Passport switches in Japan, Hong Kong, France and Ireland. ∎

MORE ATM, PLEASE

Via frame relay-to-ATM interworking, branch sites can enjoy the benefits of Bear, Stearns' ATM infrastructure.

Internet service provider ensures response times

By John Cox
San Francisco

A pathbreaking Web service provider later this month will open in Los Angeles the last of seven data centers designed to create a high-performance Web backbone with guaranteed response times.

Genuity, Inc., based here, is a Bechtel Corp. subsidiary chartered to create "electronic infrastructures" by using traditional data center disciplines to strengthen the Internet/Web for transaction-oriented, mission-critical applications.

Today, Web traffic is funneled over public telephone networks, which Genuity officials argue were not designed from the outset to cope with the rapidly increasing traffic loads. In addition, performance bogs down because the traffic funnels through a small number of network access points (NAP), where Web requests and responses are passed back and forth between different carriers.

Last week, Genuity opened its San Jose, Calif., data center, which connects via redundant fiber links to a NAP two floors below it in the same building. The Los Angeles center will complete the first phase of data center deployment, joining operational centers in Chicago, New York, Phoenix, Washington, D.C. and London.

Genuity launched virtual private network services about a year ago and is now extending these with two Web services — an intelligent routing system called Hopscotch and a Web content replication offering based on Versant Object Technology, Inc.'s Web Propagation Framework.

The company's data centers host routers, hubs, databases and Web servers for Genuity's corporate customers. Web requests come in via the NAP and are then passed to the data centers, which are linked via Genuity's redundant T-3 network. Genuity's patent-pending software technology determines the optimal return path and Web server to respond to the request.

The result, according to Sam

Mohamad, Genuity's vice president of marketing and strategic sales, is fast and predictable response times. Genuity will guarantee response times for its customers, based on their priorities and application requirements.

"We're saying to our customers: The Internet is now a business-critical tool, and our focus is on making it perform that way," he said.

PROFILE: GENUITY, INC.

Headquarters: San Francisco

Founded: 1994, as Internet Media Network; acquired in 1995 by Bechtel Corp.

Purpose: Dedicated Internet service provider running a high-performance, privately owned IP network for corporate customers, along with a full range of related data center, project management, implementation, Web hosting and consulting services.

Genuity's data center and network architecture is designed to ensure this. The data centers use top-end Cisco Systems, Inc. 7500 series routers, redundant fiber connections and a dual T-3 fiber ring.

Both local-loop and national backbone connections are leased from two separate carriers to ensure constant availability. The data centers run Web servers and databases on an array of popular Unix and NT servers, with database administrators, full data backup facilities, uninterruptible power supplies, air-conditioned, raised floor facilities and complete network monitoring via Hewlett-Packard Co.'s OpenView.

©Genuity: (415) 957-5350.

CORRECTION

NEC America is not affiliated with Packard Bell, as stated in the Network World 200 list (Dec. 23/Dec. 30, 1996, page 6). The Packard Bell affiliation is with NEC Corp. of Tokyo, which made a substantial investment in the PC maker last June.

Performance³

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GridNet's QwikLink Intranet Service, which offers users unique fingerprint authentication for enhanced security, will initially hit 50 countries next month when it is rolled out.

GridNet

QwikLink Intranet Service will let network managers arm their global workforce with a biometric security technology that authenticates users through an image of their fingerprint, said Lee Provow, vice president of marketing and sales at GridNet.

National Registry, Inc., a St. Petersburg, Fla.-based company, developed the technology that GridNet licenses.

The NRIdentity scanner attaches to a user's PC or laptop and takes an image of the user's fingerprint, which is authenticated on a Windows NT or Unix server running NRIdentity Personal Authentication Software.

Users in the 50 countries serviced will be able to connect to their corporate intranet through a dial-up IP, switched X.25 service or a dedicated frame relay connection that GridNet will provision through WorldCom.

In addition to working with WorldCom, GridNet has several international partners that helped the Atlanta-based Internet service provider to establish its 103 points of presence internationally. GridNet is in a unique position as the only carrier offering biometric security features. These features could be beneficial for network managers whose top concern is security, said Jeff Kagan, president at Kagan Telecom Associates in Atlanta, and users agree.

Users look forward to this type of service. Hilton Grand Vacations is currently supporting an international intranet for E-mail only, but wants to add more sensitive traffic such as contracts, said Kim Kreiger, MIS director at the Orlando, Fla.-based time-share company.

PSINet rolled out its PSI Intra-Net service internationally in September. The Herndon, Va.-based ISP is offering dedicated intranet services in Canada, Japan and the U.K.

Sprint, Deutsche Telekom, France Telecom and their joint venture Global One last month announced Global Intranet services that will let net managers create private intranets throughout 70 countries. It will be available in mid-1997.

British Telecommunications, plc and MCI announced an international intranet service last November in conjunction with Microsoft Corp. The service is slated for availability by the end of the first quarter in about 80 countries, said Steven Von Rump, vice president of enterprise marketing at MCI. ∎

INTERNATIONAL INTRANETS

Hoax

that spreads through E-mail," said Jonathan Wheat of the National Computer Security Association (NCSA). "Only instead of data loss, you have loss of productivity."

Worse, many of the hoaxes simply refuse to die. Good Times, for instance, first threatened to destroy hard drives in 1994 and is still scaring users. Meanwhile, it seems to have spawned similar hoaxes, including Irina, Deeyenda and — the latest incarnation — Penpal.

Even IS managers sometimes get taken in, said Alex Haddox, product manager for Symantec Corp.'s antivirus research center. Haddox said he recently learned that IS workers at a large government agency and a multinational corporation mistakenly passed along warnings about the Penpal virus.

"People see it comes from an official-sounding source and send it on," Haddox said. "They think they're doing good."

Indeed, the hoaxes have become so pervasive that the Department of Energy's Computer Incident Advisory Capability (CIAC) unit issued a bulletin about them on Nov. 20, 1996. David Crawford, the report's author, said the agency receives as many as 100 calls and E-mail messages a day about the fakes — dwarfing the number of calls about real viruses. "It's unbelievable," Crawford said. "We've just been getting bombarded."

And the CIAC is not alone. Just this month, antivirus software vendor Symantec warned about hoaxes in its virus newsletter. And the NCSA plans to feature an expert on the hoaxes at its International Virus Prevention conference this month in Arlington, Va. The title of the talk is "It's the end of the world (as we know it)."

The Federal Communications Commission even put out a press release denying it ever warned about the dangers of Good Times — one of the claims in the phony warnings.

In fact, NCSA's Wheat predicts a fresh assault this month, after thousands of new users sign onto the 'Net with modems they received as gifts.

But why are the hoaxes so persistent? Experts say, after all, that stories like Good Times are obviously frauds.

Graves has a few theories. First, there are millions of new users receiving E-mail each year who do not know much about viruses and are easy prey. Second, frequent apocalyptic warnings about real viruses have made many computer users skit-

tish, even paranoid.

And, finally, E-mail is seductively easy to replicate. Few readers ever bother to question a message before copying it to all their friends and coworkers.

Last month, for instance, an end user at *Network World* forwarded a warning about Penpal to 200 others with a few keystrokes.

It read in part: "This is a warning for all Internet users — there is a dangerous virus propagating across the Internet through an E-mail message entitled PENPAL GREETINGS! DO NOT DOWNLOAD ANY MESSAGE ENTITLED PENPAL GREETINGS!"

The message further warned that it carried a dreaded Trojan horse that would automatically

VIRUS HOAXES

Most work the same way. They warn users not to open up an E-mail message with certain words in the subject line — such as "Good Times" — or risk blowing up their hard drives. They also ask readers to tell all their friends. Ironically, most pass along the warnings with the dreaded words in the subject line. Some examples are:

Hoax	Created	Comments
Good Times	Late 1994	Most widely disseminated hoax
Penpal Greetings	Late 1996	Good Times with a new name
Irina	Sept. 1996	Started as a publicity stunt

erase the boot sector of the person's hard drive and forward itself to every E-mail address contained in the person's computer.

And many people who fall for the hoax are loathe to send out corrections for fear of looking foolish, Haddox said.

"It's a real pain in the butt," Wheat said. "But the only thing you can do is try to educate your users." ∎

ADSL

gear that pushes more bandwidth over longer distances, their initial rollouts rely on lower speed but more mature technologies that plug into existing architectures: DSL based on ISDN at 128K bit/sec and Highspeed DSL (HDSL) at up to 768K bit/sec over two wires.

"We just want to get this up and running and out the door," said Mark Gallegos, director of DSL product development for Pacific Bell.

It is important to users that distance questions get sorted out. If the user has to be within a limited range of a central office, service availability for, say, a large telecommuting force will be restricted and spotty.

Basic Rate Interface ISDN, the 128K bit/sec dial-up choice for many telecommuters and Internet users, works over 18,000

feet of two-wire copper, and that can be doubled with a repeater. But users continue to complain that they cannot get it because they are too far away.

Ameritech's ADSL trials show that ADSL modems can support 1.5M bit/sec over a local loop

BRAKES ON DSL

Factors affecting actual throughput of Digital Subscriber Line service:

▶ Length of line
▶ Gauge of wire
▶ Presence of bridge taps and load coils
▶ Speed of network being accessed, i.e. the Internet

that is 13,000- to 18,000-feet long. They expect technology developments to push that distance to more than 18,000 feet by the time they roll out service toward the end of the year.

The most optimistic bandwidth/distance result is from

MCI Communications Corp. trials in Sergeant Bluff, Iowa. MCI reports that NEC Australia gear is delivering 6M bit/sec over 13,000 feet.

Rosy picture

Other carriers are reluctant to reveal numbers, but most say the optimal scenario MCI paints is the exception. The rest are still trying to understand the restrictions imposed by the gauge of the copper wire in the local loop and whether the line is festooned with load coils and bridge taps that are used to enhance lines for voice.

To help deal with the problem, carriers embrace Rate Adaptive DSL (RADSL). It allows a single device to adjust bandwidth based on how good and how long a line is.

In deciding what speeds to offer, carriers must also anticipate that factors beyond their control will affect the actual

speeds Internet users get to their PCs over DSL lines.

"The telco can provide 1.5M bit/sec to the central office. Then, where the customer goes, nobody knows. They may hit a zillion other servers, and they may not be able to handle anywhere near 1.5M bit/sec," GTE's Nogiueria said.

Carriers are also struggling with how to provision the services. They would like to dump DSL traffic onto their data networks as soon as possible.

Carrier preference is for ATM to ride directly out of the customer premise over ADSL.

Carriers want those types of systems, from the user premises to the central office, before they widely deploy services. And those systems will not be available for general deployment until late this year.

As a result, they predict that next year will be when ADSL gets beyond the experimental user. ∎

WANs & Internetworking

Briefs

IETF working group formed for 'label switching'

By Jim Duffy
San Jose, Calif.

Following last month's IETF meeting here, efforts are now under way by several vendors to define the scope of a working group formed to standardize techniques for network layer switching.

The Multiprotocol Integrated Switch-Routing (MISR) working group is attempting to fuse various proposals for "label swapping-based forwarding," or label switching, to produce a single standard for integrated switching and routing.

Label switching — embraced by Cisco Systems, Inc.'s Tag Switching, IBM's Aggregate Route-based IP Switching (ARIS) and Toshiba Corp.'s Cell Switch Router proposals — is viewed as a way to increase the scalability, flexibility and performance of routing.

Cisco, IBM and Toshiba presented their respective proposals during a birds-of-a-feather (BOF) session at the Internet Engineering Task Force meeting. The BOF subsequently led to the formation of the MISR working group.
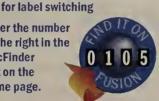
"From an engineering perspective, they're extremely close" in the way the proposals implement label switching, said

Dave Benham, senior ATM product manager at Cisco. "I think we got the ball rolling pretty fast given that there's very little difference between these."

Label switching advocates the addition of forwarding bits to packets or flows in order to steer data onto specific virtual circuits that can guarantee network service levels, depending on the application. Label switching is also viewed by some vendors as an optimal way to combine packet-based routing with ATM switching.

With these goals in mind, the MISR is hashing out its charter, trying to come up with a plan that is broad enough to address the problem at large while avoiding the creation or duplication of routing protocols.

The preliminary objectives of the MISR group are to specify standard protocols for maintenance and distribution of label binding information to support

MISR MOTIVES

▶ To specify standard protocol(s) for maintenance and distribution of label binding information to support...

   -unicast destination-based routing
   -multicast routing
   -hierarchy of routing knowledge
   -paths different from the one constructed by destination-based forwarding

... with forwarding based on label-swapping

also...

▶ To specify standard procedures of carrying label information over various link level technologies

▶ To specify a standard way to allow operation/co-existence with ATM standards

▶ To provide support for QOS (e.g. RSVP)

▶ To define standard protocol(s) to allow direct host (e.g. server)

unicast destination-based routing; multicast routing; hierarchy of routing knowledge; and paths different from the one constructed by destination-based forwarding.

All of these applications would require routers and switches to swap labels as a way to exchange forwarding information.

An additional MISR objective is to specify standard procedures of carrying label information over various link-level technologies such as frame relay, Ethernet, token ring, ATM and Packet-over-SONET. Another is to allow operation, coexistence and optimization of ATM standards and hardware, including the ability to merge virtual circuits.

Lastly, MISR will attempt to provide support for quality-of-service mechanisms, such as the Resource Reservation Protocol (RSVP), in label switching and define standard protocols to allow direct host/server participation.

Cisco delivered proposals at the IETF BOF on how Tag Switching could be used in multicast and RSVP applications, and to support classes of service. ■

IBM mid-range gets TCP/IP kick

By Michael Cooney
Chicago

Users looking to move their mid-range Application System/400 servers into the TCP/IP fold may want to explore a new option from Perle Systems, Ltd.

The firm recently added TCP/IP support to its 494E remote AS/400 communications controller, letting users consolidate separate SNA and TCP/IP networks.

The 494E will also eliminate the need to deploy an SNA tunneling or Data Link Switching encapsulation-based device to bring SNA traffic over an IP backbone.

"The central ideas with the new controller are to reduce the complexity of supporting multiple protocols and decrease the number of protocols users have to support across the WAN," said Sean O'Donovan, director of

O'Donovan says the AS/400 is becoming a more popular TCP/IP player.

worldwide marketing at Perle.

The Perle 494E is an IBM 5494-compatible controller designed to tie 160 token-ring or Ethernet users to an AS/400 host. The 494E can also support 168 twinaxial or 48 ASCII users.

The key new feature for the 494E, however, is the addition of IBM's AnyNet technology to the controller's software package, which lets the controller flow SNA 5250 traffic over a TCP/IP backbone.

AnyNet is protocol conversion software that enables application-to-application communication over any underlying protocols.

IBM has deployed AnyNet in a number of its products, including VTAM on the mainframe and natively in the AS/400's operating system.

Its 5494 controller does not support AnyNet, but IBM executives have said AnyNet technology eventually will be integrated in most of its communications boxes.

"Still, in the AS/400, AnyNet doesn't support the traditional 5250 user, where there are millions of dollars in applications and hardware," O'Donovan said.

Having AnyNet on the controller also eliminates the need to support it in each PC or terminal needing to communicate with the AS/400.

Perle said it hopes the AnyNet support will boost its standing against its chief rival, IBM.

According to O'Donovan, Perle has about a 30% market share vs. about 50% to 60% for IBM.

"About 80% of our customers say they want TCP/IP in the controller, and this is the fastest way to get it there," O'Donovan said.

The 494E is available for $3,995. Existing users can add AnyNet software for no charge.

©Perle: (630) 789-3171.

INTERNETWORKING MONITOR

Join the action at ComNet '97

I n just a few weeks, the eyes of the nation will focus on Washington, D.C. to witness an event that takes place but once every four years. (I don't know about you, but I'm still waiting for my invitation to Clinton's inaugural to arrive. Come to think of it, I didn't even get a Christmas card from them!)

Then a week or so after that, at ComNet '97, we can all witness an event that, to my knowledge, has never taken place before: The Great Switching Debate.

This event, brainchild of *Network World* Editor in Chief John Gallant, brings together senior technical executives from leading networking vendors to debate the merits of their switching strategies.

Questions will be posed by Thomas Nolle, noted industry analyst and president of CIMI Corp., yours truly and a player to be named later who will be a distinguished member of the end-user community. Gallant will serve as moderator.

The lineup of participants is impressive. In alphabetical order by company (to avoid bruised feelings), they are Mick Seaman of 3Com Corp., Bill Hawe of Bay Networks, Inc., Chris Oliver of Cabletron Systems, Inc. and Alan Marcus of Cisco Systems, Inc.

While I hope you'll pencil this event into your schedule, my main motivation for bringing up the topic is to ask for your help. Since I'll be there to represent the interests of network managers, I want to make sure I'm on the right track with my questions.

As I began thinking about my questions, I first wondered if many network managers had sufficient time to even follow the carefully positioned strategies of these various companies. That's Question 1 for you.

Kevin Tolly
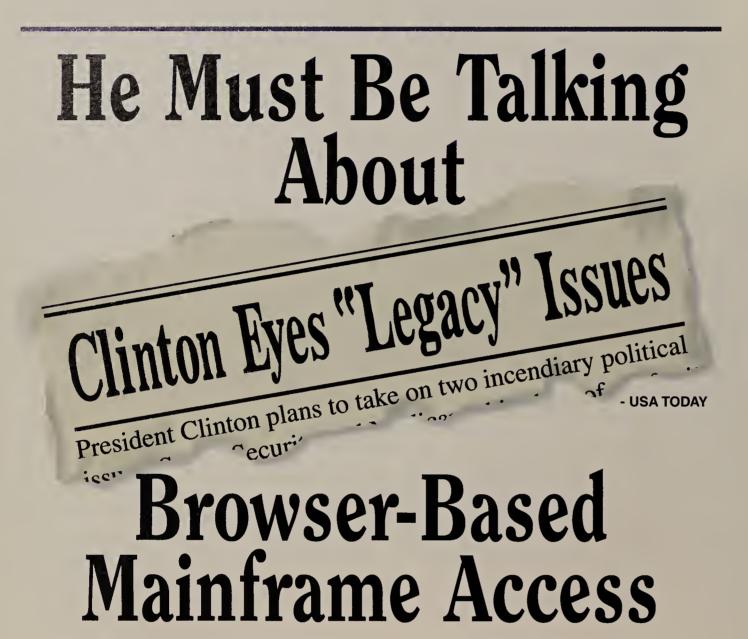
For my second question, I'd like to know how much weight you put into the strategy. Do you consider it a major determinant in your decision-making process, or is it merely a tiebreaker when all other factors are equal?

My third question is one of trust. Simply put: How much faith do you have that any given vendor is going to follow through on the strategy? I'm not implying that we necessarily mistrust vendors; it is just that the rate of change is so great that following through may be a near-impossible task.

Finally, if there is a question you'd like this august group to answer, let me know. There are no bounds to the questions as long as they relate to the past, present or future switching strategies of these companies. Perhaps your company bought in to a strategy that now appears abandoned. Why not let a top exec explain that one away. If you've got an "I followed the strategy and I am a) pleased or b) disappointed" story, let's hear about it. If I reference anything you've sent me, I won't reveal any details or company names unless you explicitly give me permission.

For those of you who followed my column throughout 1996 and want to hear more about LAN switching and ATM — legacy LAN integration — you can do that at ComNet, too. I'm presenting half-day tutorials in each of those two areas. For me, it is a good chance to interact with my readers, so I hope you'll consider coming. Or just stop by to say hello.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (908) 528-3300 or via the Internet at ktolly@tolly.com.

Carrier Services

Covering: Local and Long-Distance Services • Value-Added Networks • Cable, Satellite and Wireless Networks • Regulatory Affairs • Carrier-Based Internet Services

FCC favors gradual reduction of access rates

By David Rohde
Washington, D.C.

As expected, the Federal Communications Commission has issued a set of proposals to change the way local exchange carriers charge for access to their networks.

But the Christmas Eve proposals fell far short of a directive to regional Bell operating companies to dramatically lower their access charges.

Instead, the FCC said it was considering a scheme under which RBOCs would gain flexibility to lower access rates for some customers in response to emerging local competition while maintaining existing rates for other customers.

Alternatively, the FCC said it would consider dictating a schedule for RBOCs to lower all their access charges but added that such an approach would "require that the commission play a greater role in the telecommunications marketplace." The FCC recently has endured harsh criticism from Capitol Hill for issuing overly specific rules to implement congressionally mandated telecom reform.

Currently, RBOCs and other local carriers charge long-distance carriers 2 to 4 cents per minute on either end of a voice or data call unless users have a dedicated access line on both ends. The long-distance carriers contend they must pass along these charges to users in their long-distance rates.

Observers said if the FCC adopts the first proposal, under which RBOCs would reduce access rates in response to competition, it could benefit customers in big cities more than others. That's because most local competitors that are building their own networks are targeting major metropolitan areas to take on the RBOCs and could offer lower access charges to long-distance carriers.

Some players said such an approach is unlikely to benefit many users. MCI Communications Corp. officials recently said competition for access rates in one city where a call originates would not necessarily affect access rates in another city where the call terminates.

Also as expected, the FCC

HOW LOCAL CARRIERS GET INTERSTATE ACCESS REVENUE

Subscriber line charge paid by users 30.3%

Dedicated access line charges paid by users 13.2%

Other 10.3%

Charges paid by long-distance carriers per minute of traffic 46.2%

Based on annual revenue of $23.4 billion.
SOURCE: FCC, WASHINGTON, D.C.

issued a separate notice requesting for the first time public comment on whether Internet service providers should pay access fees to RBOCs.

The FCC said it will not now impose such a requirement on ISPs while access fees remain as high as they are. But the commission said it was considering changing the regulatory structure that has kept ISPs exempt from paying RBOC fees other than basic line rates.

Currently, ISP's do not pay access charges because they are considered providers of enhanced services rather than basic transport provided by long-distance carriers. ■

In-Site

Robinson Oil strikes gold with CDPD

By Denise Pappalardo
Elmsford, N.Y.

Procedures and paperwork can bog down most companies, but Robinson Oil Corp. was drowning in paper — that is, until the heating oil company discovered Cellular Digital Packet Data (CDPD).

Under its old system, Robinson Oil supported two dispatching centers where employees wrote out, filed and assigned oil delivery tickets for 46 drivers who together made about 900 deliveries a day.

Each driver would pick up a stack of tickets at a depot to take out on the road. At the end of the day, the completed work tickets were returned and then entered manually into the company's computer system.

Customers seeking the status of their account or a delivery had to wait until late that night, said Kevin Donahue, operations manager at Robinson Oil.

With CDPD, everything has changed.

Now drivers can download their work orders and print tickets as each job is completed from their PenKey 6100, a pen-based CDPD device from Norand Corp., a Cedar Rapids, Iowa-based equipment manufacturer.

CDPD removed several procedural steps and is saving the company at least $70,000 per year

HEALTHY GROWTH FOR WIRELESS DATA

Wireless data services are still considered to be best suited for vertical market industries. Citing lower prices, ubiquitous coverage and more widely available end users, analysts at Boston-based Yankee Group predict services such as CDPD will continue to grow.

U.S. subscribers (in millions)

| 1996 | 1997 | 1998 | 1999 | 2000 |

based on the elimination of jobs, Donahue said. Robinson Oil, based here, expects to see more savings.

But it is difficult to speculate on exact dollar amounts because Robinson Oil has only been using AT&T Wireless Services' CDPD for the past few months, according to Donahue.
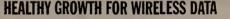
Robinson Oil plans to bring CDPD into other parts of its company. The repair and maintenance department at Robinson Oil has been using another digital cellular service but will be moving onto AT&T's CDPD network, Donahue said.

The department built a cellular data repair dispatch system from scratch because the technicians were losing too much time getting information from radio services, Donahue said.
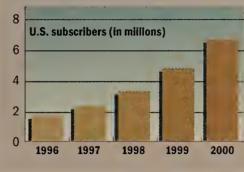
"We developed the system out of necessity. It was an issue of productivity and time, and time is money," he said.

While CDPD has had a slow start getting into the market, analysts agree the technology is on a healthy growth path for a variety of reasons.

"There is more nationwide CDPD interoperability coverage than ever before," said Roberta Wiggins, director of wireless mobile communications at The Yankee Group, a Boston-based consultancy.

Special Focus

DSL backers hope to clear hurdles in '97

By Tim Greene

8M bit/sec Internet access over your regular phone line sounds great, right? That is the promise by proponents of Digital Subscriber Line (DSL) technology.

But despite all the great things bandied about, DSL has a number of hurdles to clear before you can actually get it, which will probably occur sometime next year.

Service providers are still waiting for network-grade gear on which to deploy the service. In addition, pricing is still uncertain, and it remains unclear how much hassle it will be for users to get DSL installed.

But carriers say they have learned a painful lesson from ISDN, the digital dial-up service that has been so difficult for users to provision that they have shunned it. The lesson: Make it easy for the customer.

So, through ongoing service trials, carriers are trying to work out potential glitches ahead of time.

Hidden costs

Carriers plan to require only that the user have a PC with an Ethernet card and Web browser. According to regional Bell operating companies, the phone company will provide and install the modem and whatever customer-site internal wiring is needed. Similarly, Internet service providers that offer DSL access to the Internet will set up the user gear.

DSL GLOSSARY

Digital Subscriber Line (DSL) technology comes in several different flavors:

ADSL: Asymmetric DSL runs at up to 8M bit/sec toward the user and up to 640K bit/sec away from the user.

HDSL: High-bit-rate DSL over two wires runs up to 768K bit/sec in both directions. It runs up to 1.5M bit/sec across four wires.

RADSL: Rate Adaptive DSL is a variant of ADSL with software that can adjust speed down for long or low-quality lines.

SDSL: Symmetric DSL runs at 384K bit/sec in both directions.

VDSL: Very high-speed DSL runs up to 60M bit/sec toward the user and 6.4M bit/sec away at 1,000 feet; meant for the last link in a fiber-to-the-curb network.

Later, as the service gets more popular and standards are firmly established, the prices of the modems are expected to drop from today's $1,000 or more per line to $500 or less. Then users will be expected to buy their own modem or provide DSL-equipped PCs.

The price of the service is expected to be somewhere between $40 and $100 per month for the DSL line, according to RBOCs that are trialing the service.

In addition, users will have to pay an ISP for Internet access. It is undetermined what that additional fee will be, but the cost will increase as bandwidth increases.

While the fastest DSL flavor offers 8M bit/sec bandwidth coming toward users and 640K bit/sec away, initial speeds will be slower. Even so, the planned 1.5M bit/sec connections to the Internet are more than 50 times faster than one over a 28.8K bit/sec modem.

That speed increase will be noticeable enough to affect how users employ the Internet.

For example, video files that would take minutes to download will instead take seconds, which means users will download those files more often, according to Brian Ford, BellSouth Corp.'s manager of residential broadband data services.

That will result in an undetermined increase in use of the Internet, which will affect carriers, ISPs and the Internet backbone itself.

In response, BellSouth is developing new usage models to determine how much switching capacity it will need to accommodate DSL traffic, Ford said.
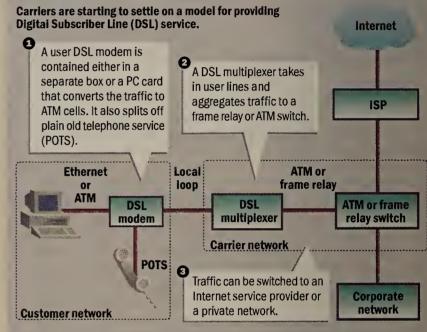
Because DSL is a dedicated service and not dial-up, users will have nailed-up access to whatever location — the corporate network or the Internet — they desire. That will create a new way of thinking about remote connectivity, according to David Sobin, vice president of Ariel Corp., which will announce its DSL system later this month. "The most important thing is you're online all the time, and when it's on all the time, it's a utility," Sobin said.

Quality of service

The carriers' ultimate goal is for the traffic to leave the customer site as ATM, be aggregated at a central office and dropped onto an ATM switch. Tom Starr, a member of Ameritech Corp.'s senior technical staff, said someday PC makers will offer network interface cards that perform the conversion and are fitted with a DSL port.

But in the near term, users will likely be required to have only an Ethernet port on their PC that connects to an external DSL modem that will perform the cell conversion, Starr said.

Alcatel Telecom has designed such a system for four regional Bell operating companies: Ameritech, BellSouth, Pacific Bell and SBC Communications, Inc. Other vendors are working on similar gear.

With DSL traffic on an ATM network, carriers will be able to offer quality-of-service options to users. For example, a single carrier would control the connection end-to-end for a telecommuter tapping into the corporate network.

The carrier could offer constant bit rate (CBR) service for videoconferencing and variable bit rate (VBR) for file downloads.

The monthly price range might be $50 to $100 for VBR and $125 or so for CBR, according to Mark Gallegos, director of DSL product development for Pacific Bell.

In addition, using permanent or switched virtual circuits, carriers could set up high-speed DSL private intranets for customers.

Harder than it looks

On the face of it, DSL technology is deceptively simple; it operates like an analog modem on steroids. Put compatible modems at either end of a connection, and you have broadband communication over a copper local loop.

It's actually a lot more complex. And unlike an analog modem, DSL requires carriers to overlay a new DSL network on top of their existing frame relay or ATM data networks.

That takes time to develop, and carriers expect it will be this time next year before they have what they need to deploy DSL widely. ∎

THE LOOK OF DSL SERVICE

Carriers are starting to settle on a model for providing Digital Subscriber Line (DSL) service.

① A user DSL modem is contained either in a separate box or a PC card that converts the traffic to ATM cells. It also splits off plain old telephone service (POTS).

② A DSL multiplexer takes in user lines and aggregates traffic to a frame relay or ATM switch.

③ Traffic can be switched to an Internet service provider or a private network.

The batte of DMT vs. CAP

To protect their equipment investment, potential users of Asymmetric Digital Subscriber Line (ADSL) technology have to pay attention to a standards struggle between two underlying technologies.

Discrete Multi-Tone (DMT) modulation is the ADSL modem standard approved by ANSI. But DMT is being challenged by a second — and, in fact, older — technology known as Carrierless Amplitude Phase (CAP) modulation.

Both work very well, according to users at telephone companies that are trialing ADSL before they market the services. From the user point of view, there is very little difference in performance.

And as long as phone companies supply the customer premise equipment (CPE), the end user does not have much to worry about. The carrier will make sure the modems at both ends use the same line code.

But once ADSL service becomes well established, the business model will change and users will be expected to supply the ADSL modem at their end.

If more than one coding scheme is accepted, that means the user-end modem would have to match the one in the phone company central office.

While that seems a simple enough task, it could also limit the user's future options.

For example, if a company wanted to change its ADSL service provider, the user would either have to find a new carrier that uses the same type of modem or buy new ones. At $500 each, calculating the cost of mass-producing the modems and adding in the expense of swapping them out at every remote location, that is no small consideration.

According to Tom Starr, who chairs an ANSI subcommittee dealing directly with ADSL standards, DMT remains the only ANSI standard for ADSL and the only option the committee is working on seriously.

CAP has been formally proposed as a standard along with DMT, but "we've done very little on those contributions," Starr said.

CAP proponents, however, have gone over Starr's head, pushing their case with the committee that oversees Starr's. So stay tuned.

— By Tim Greene

Local Networks

Covering: Servers • Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Newbridge to take UB off Tandem's hands

By Jodi Cohen
Kanata, Ontario

After years of shopping its struggling UB Networks, Inc. subsidiary around, Tandem Computers, Inc. has finally found a buyer: Newbridge Networks, Inc.

The estimated $250 million to $350 million deal, which had been anticipated, should give Newbridge a stronger presence in the LAN internetwork market with UB's LAN backbone switching hub as well as its high-end customer base (*NW*, Dec. 9, 1996, page 6).

Most of Newbridge's revenue is derived from sales of WAN products, and less than 5% of its revenue comes from its Vivid LAN product line, according to Rick Tinsley, vice president and general manager of the Vivid business unit.

UB's high-end GeoLAN/500 switching hub complements Newbridge's Vivid workgroup switches and edge devices, ana-

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Dissecting Newbridge's acquisition of UB

● **Purchase price estimated to be between $250 million and $350 million.**

● **Newbridge gains a stronger presence in the LAN internetwork market.**

● **UB's high-end GeoLAN/500 switching hub joins Newbridge's Vivid line of workgroup switches and edge devices.**

● **UB — previously owned by Tandem — becomes a wholly owned subsidiary of Newbridge.**

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lysts said. But one UB customer wondered how the Newbridge products will mesh with his ATM gear from UB.

"I don't know if the UB ATM products will be able to support Newbridge's [Multi-Protocol over ATM] approach, which will be important to us down the road," said Dan Howard, director of technical support at Express Scripts, Inc., a health care management company in St. Louis.

"Also, UB's ATMView net management product looks like it will be really good for managing ATM networks, but I'm not sure if, how or when Newbridge plans to integrate it into their

product line," he said.

Still, Newbridge said the deal will let the company focus more on corporate customers.

"Roughly two-thirds of [Newbridge's] revenues in recent years have come from carriers and about one-third from end users," Tinsley said.

"With the addition of UB, we're moving that balance more toward 50-50, which has always been our intent," Tinsley added.

Under the agreement, UB will become a wholly owned Newbridge subsidiary. The deal is expected to be finalized this month. ■

HP server takes aim at small workgroups

By John Robinson
Palo Alto, Calif.

Hewlett-Packard Co. this week will introduce a low-end server that can grow to include features normally found in the bigger brothers of the company's server family.

The HP NetServer LD Pro, which costs as little as some PCs, features Pentium Pro processing power for small to midsize workgroups, replacing the company's Pentium-based NetServer LC series.

With prices starting at around $3,400, the LD Pro includes three PCI slots and two EISA expansion slots with an internal storage capacity of up to 35G bytes and memory capacity of up to 512G bytes. A second processor can be added, matching the processing power of other servers in HP's L series. Up to 512M bytes of ECC memory and up to 27G bytes of total storage are available.

The server also comes equipped with HP's DeskDirect 10/100 TX PCI LAN adapter. Like all HP NetServer L series systems, the server supports Windows NT, NetWare, SCO Unix, VINES and OS/2 LAN Server.

For management of the server and the network, the LD Pro includes HP Order Assistant and HP NetServer Navigator. It also includes HP OpenView Workgroup Manager, which monitors network and server health, and sends alerts when the device encounters problems. For more complete management services, OpenView Professional Suite is available.

The LD Pro will face some stiff

NetServer LD Pro

● Available with single or dual 180-MHz to 200-MHz Pentium Pro processors
● Four PCI slots, two EISA slots
● Up to 512M bytes of memory
● Ultra-SCSI controller
● Priced starting at $3,399

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competition, as HP's announcement rounds out a year in which server vendors recognized the needs of smaller businesses with competitively priced entry-level servers. Dell Computer Corp., NCR Corp. and IBM, among others, challenged price/performance figures with low-cost offerings in the latter half of 1996.

The NetServer LD Pro, with a 180-MHz Pentium Pro processor and 32M bytes of ECC memory is available now starting at $3,399.

©HP: (800) 752-0900.

Microsoft squashes NT bugs

By Christine Burns
Redmond, Wash.

Microsoft Corp. has released a second service pack for Windows NT 4.0 that fixes more than 100 bugs and adds several connectivity features.

Most of the bugs addressed arise only in specific net situations and do not reflect any major holes in NT 4.0, said Jeff Price, a Windows NT Server product manager. More common bugs remedied include:

● The Dynamic Host Configuration Protocol (DHCP) server giving out the same IP address to multiple clients.
● Failure of the directory to replicate data to all servers.
● The NT Remote Access Service (RAS) not returning expired IP addresses to the static address pool.
● Internet Information Server (IIS) running out of memory.

New connectivity features in the service pack include DHCP Server support for legacy BOOTP clients and the ability for PPP clients to authenticate to NT 4.0 RAS. The service pack also includes support for 128-bit encryption for more secure connections over wide-area links.

Additionally, NT 4.0 Service Pack 2 ships with Internet Explorer 3.01 and IIS 3.0, which includes support for Active Server pages, Microsoft's Index Server 1.0, NetShow audio and video services, and Front Page 97 server extensions.

NT 4.0 Service Pack 1 shipped early last fall, and Price said Microsoft will continue to release them on a quarterly basis. NT 4.0 Service Pack 2 is the first to include a graphical uninstall program that lets users roll back any bug fix. Users can download NT 4.0 Service Pack 2 via ftp:// ftp.microsoft.com/bussys/winnt/ winnt-public/fixes/usa/nt40/ ussp2/.

©Microsoft: (800) 370-8758.

Time for an NT security checkup

H ow often do you test your Internet, intranet or network security? Dan Farmer, coauthor of the Security Adminis-trator Tool for Analyzing Networks (SATAN), recently tested more than 1,700 Internet sites and found that more than 60% of them — including banks, newspapers, credit unions and government sites — could be broken into or destroyed relatively easily.
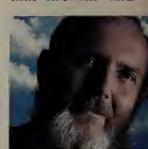
Some of these firms failed to take the most elementary steps to protect access to their servers and files. And most of them probably used Unix, which is notorious for security holes that have to be plugged to provide even minimal security.

But if you're running Windows NT for file, print, intranet and Internet services, you're relatively safe, right? Maybe not.

Farmer's first rule of computer security: No one is more vulnerable than the company that thinks it is secure. While it is true that most methods for bypassing network security are well known, each day brings new methods or twists on old means used to compromise your network. Each new version of an operating system plugs some of the old holes, while introducing new ones. Whether your NT Server is Version 3.5, 3.51 or 4.0, you should regularly be checking the Web's Windows NT Security Issues page (www. somar.com/security.htm) to learn about the latest information.

Beth Schultz, executive editor of *Network World's Intranet* magazine supplement, recently reminded us in an article on *NW's* Web site (''Safe and Sound'' in the *Intranet* magazine section of www.nwfusion.com) that firewalls and other security devices are only valuable if they are used correctly. While you're checking out the article, also look at the Firewall Buyer's Guide linked to it.

One more site — **Dave Kearns** which, in turn, links to other security information — is www.netsurf.com/nsf/latest.focus.html. This focuses less on the dangers of an outsider compromising your net and more on end users compromising their own systems through poor Internet-use practices.

Remember, not every security problem involves an attempt to break into your system.

In fact, most network security breaches are caused or initiated by a company's own workers. Lax or nonexistent security gives employees access to areas of the network they shouldn't be allowed to see. If you have access to Usenet, the group comp.os.ms-windows.nt.admin.networking is a good starting point for security issues.

If you know of any other good security information sources, message me, and I'll pass them along in a future column. More information about SATAN is available at www.fish.com/satan/.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@ msn.com.

Client/Server Applications

Covering: Databases • Messaging • Groupware
Conferencing • Imaging • Multimedia • Development

Lotus Notes replaces lecture notes

Drexel University puts groupware to the test as the basis of new online degree program.

By Paul McNamara
Philadelphia

You would love to see your shop's fledgling IS professionals get their master's degrees, but neither you nor they can imagine them juggling night classes with already jam-packed work schedules and home lives.

Drexel University believes it has a solution — the Asynchronous Learning Network — that could eventually revolutionize post-secondary education and be a boon for the increasingly Web-conscious groupware industry.

In September, the Philadelphia school began offering a master of science in information systems using Lotus Development Corp.'s Notes/Domino software and US WEST, Inc.'s Interact for Lotus Notes public network service, instead of textbooks and lecture halls. In other words, there is no frantic commuting or bleary-eyed class time because students access course materials, consult faculty and interact with classmates online at their convenience.

"There is going to be a lot of asynchronous collaborative work happening over the Internet or happening over intranets, and we think this is one way of introducing people to that kind of environment," said Charlton Monsanto, technology director at Drexel's College of Information, Science and Technology.

Students and faculty use the Internet to access the Notes server, located at US WEST's Minneapolis facility, to send and receive homework and discussion points (see graphic).

Students also have course materials and applications on their Notes clients.

Notes' well-known replication technology is vital to the program because it allows students to download material from a remote location and work on it offline.

All 18 members of the program's initial class, who live throughout the Northeast, are IS employees for insurance giant CIGNA Corp., headquartered here. Four of the program's 12 courses are geared specifically to CIGNA's needs.

"You probably learn as much, if not more, than you would learn in the regular classroom," said student Deanna Falco, director of applications in CIGNA's Production Applications Center. "There is actually more sharing of information; everybody participates in everything," she said.

Making the grade

Although constrictive in that it requires students to be or become Notes-proficient, the program's technology is getting solid grades.

"To my knowledge, we've barely gone down," said Stephen Andriole, chief technology officer at CIGNA. "There have been a couple of days when there has been a delay in replication, but it's been extremely reliable."

Drexel could have brought the Notes server in-house, Monsanto said, but with ramp-up, scalability and contingency concerns in mind, the school opted for US WEST.

While Drexel is planning to launch a Domino-based Web page with access to promotional materials and archives, the actual course delivery will continue via the Notes Public Network for now, Monsanto said. ■

LONG-DISTANCE LEARNING . . . WITHOUT STAMPS

Drexel University's Asynchronous Learning Network offers IS professionals an "any time, any place" master's curriculum using Lotus Notes and a US WEST Notes database host.

US WEST Notes database host — Internet connection TCP/IP — Students at home — Drexel Notes servers — Drexel faculty and staff — Students at work — CIGNA firewall and internal Notes servers

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Internet development

Segue delivers beta version of software for automated testing of Web applications

By John Cox
Newton Centre, Mass.

Segue Software, Inc. last week began beta-testing a product code-named Silk that lets developers run automated tests of Web applications.

Developers can use Silk to put each element of a Web application, including HTML formatting, embedded Java applets and ActiveX controls, through its paces on a variety of browsers and operating systems.

"There are thousands of variations on how to create Web pages," said Paul Pietryka, quality assurance engineer with Software Quality Solutions, Inc., a North Brunswick, N.J., consulting company that has been using an early version of Silk.

"Silk can take all this information and treat each object on the Web page [distinctively] so you can manipulate and test it in any way, shape or form," Pietryka said.

As application developers struggle to create more complex Web applications, they are caught in a bind: They need to test new applications, but they lack the tools to do so.

Go online for a look at link checkers, which help ensure Web hyperlinks work.

0107 FIND IT ON FUSION

Enter the number to the right in the DocFinder box on the home page.

"They have to do time-consuming manual testing for every browser and platform," said Brian Lesuer, Segue's executive vice president of research and development.

The Silk technology, for which Segue is filing a patent, works with Segue's QA Partner, which is used to create automated tests for Windows graphical user interface applications.

Pietryka said he uses Silk to identify the elements on the Web page and create a hierarchy of relationships among them.

He then programs or records a series of Web interactions — accessing the Web server, clicking on a checkbox, filling in text fields and so on. These interactions are generated as scripts that can be run unchanged in any browser to test the application.

Silk is scheduled for general release by June. Pricing has not been determined.

⊘Segue: (617) 796-1000.

SHARED LOGIC

The next generation of messaging

W [illegible] in the third generation of [illegible] messaging technology: Internet client/server messaging

The first generation — host-based messaging — began in the 1970s. This was the age of big iron: mainframe and departmental messaging systems such as PROFS and All-in-1. Their value proposition was to provide the large company with basic E-mail functionality in a reliable manner at a low cost of administration.

The second generation began in the mid-1980s with today's legacy systems: file-sharing LAN E-mail products such as cc:Mail and Microsoft Mail. These systems were designed to provide basic messaging with a friendlier user experience, lower end server platforms and workgroup-level administration. But LAN E-mail technology based on file-sharing models has not scaled well in large companies.

In the early 1990s messaging ecosystem, the dinosaurs never completely died out. It was a time of coexistence; it was a time that couldn't last.

The third generation of messaging began as the Big Three — Lotus Development Corp., Microsoft Corp. and Novell, Inc. — tried to replace proprietary LAN E-mail systems with proprietary client/server messaging and groupware offerings. Their selling point was to combine mainframe-like reliability and scalability with the user-friendly LAN E-mail experience.

But another megatrend was building: intranets. In words that now seem prescient, we wrote in a 1995 issue of the *Rapport Messaging Review* that new **Daniel Blum** messaging offerings supporting Multipurpose Internet Mail Extensions and HTML "could blow everything else out of the water." And what a scramble has ensued since.

Howling winds of Internet/intranet technological discontinuity swept the Big Three's product plans aside like so many dry leaves last year. Client/server messaging morphed into Internet client/server messaging. Companies such as Coolinate.com, Isocor, Netscape Communications Corp. and Software.com, Inc. emerged as rising stars.
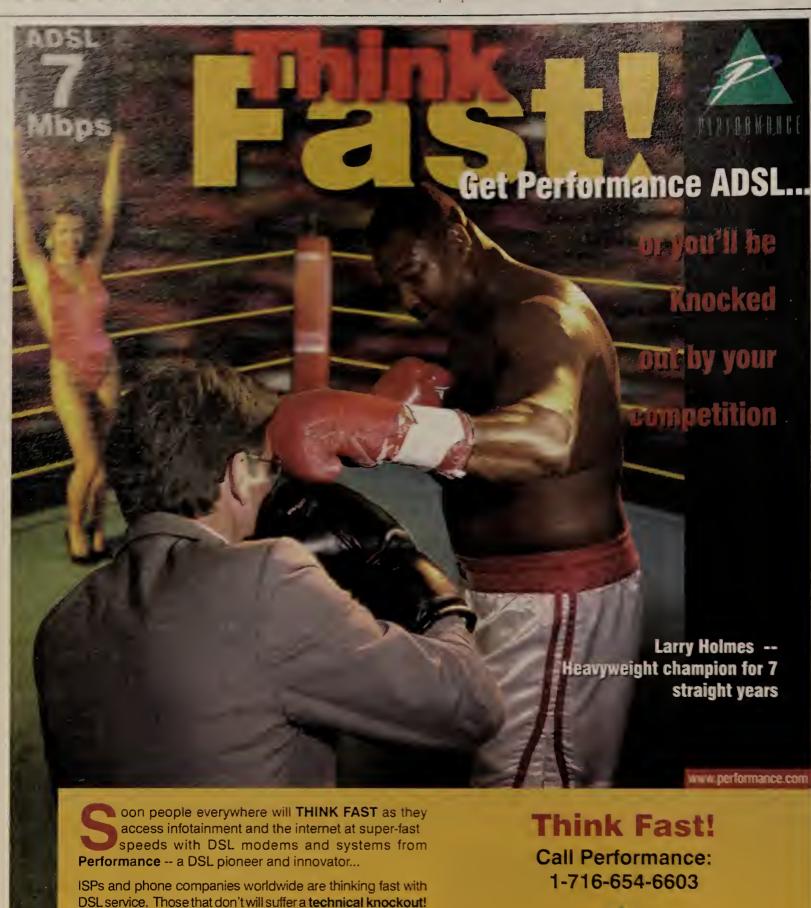
Yes, the Big Three got standards religion. After ages of lip service and gateways, they commenced a desperate struggle to blend HTML, Post Office Protocol 3, Lightweight Directory Access Protocol and more into their rich collection of features.

In 1997, the buzzwords and acronyms will filter into products. The Big Three as well as Netscape, Hewlett-Packard Co. and others will meet again on more level ground. And they will be challenged by hoards of agile start-ups talking about Java, distributed objects, network computers and more.

There will be lots of new products this year, many of which are add-ons to your existing products. To avoid products of little value chasing problems of small consequence, make sure whatever you deploy is guided by a clear vision, something like this: Internet client/server messaging products will blend seamlessly into networked desktop of perfectly linked, interoperable objects and programs in a reliable, secure and scalable manner.

Nice dreams make good New Year's resolutions, don't they?

Blum is a principal at Rapport Communications, a consultancy that focuses on messaging, groupware and electronic commerce. He can be reached via the Internet at dblum@[illegible].com.

Covering: Internet Technologies and Services
for Collaboration and Electronic Commerce

One million free E-mail subscribers can't be wrong

By Chris Nerney

As the sole remaining provider of truly free, advertiser-supported E-mail, Juno Online Services seems well positioned to dominate a potentially vast market.

Unlike E-mail programs that require an Internet connection, Juno's free software allows users with a PC and modem to retrieve their E-mail by dialing an 800 or local phone number. Advertisements appear on-screen along with E-mail messages.

Freemark, which launched its service shortly after Juno's, employed an identical technological model. While Freemark was able to attract 50 national advertisers, its subscriber base only reached

Advertisements are placed at the top of each E-mail message sent and received through Juno Online Services.

The New York-based start-up today announced that it has more than one million subscribers. Fast work, considering the service has been available only since late April. But that's what aggressive marketing and deep pockets can do for you.

Juno's strategy — spend heavily up front to build a large subscriber base that will attract advertisers — was enough to force its lone competitor in the direct-dial free E-mail market, Freemark Communications, Inc. of Cambridge, Mass., out of business last month.

Whether it's enough to eventually get into the black, however, may be another matter.

"Profitability is a question," said analyst Peter Krasilovsky, vice president of Arlen Communications in Bethesda, Md.

"Juno has one revenue stream, which is advertising. And though advertising is an area that is beginning to emerge, it hasn't yet taken off," he said.

Juno Chief Executive Officer Charles Ardei acknowledged that the company "certainly is not making money yet," though he added that the goal is to break even sometime this year.

The potential market for Juno and other E-mail vendors is huge. With a current estimated 60 million users, E-mail is the

50,000.

Vin Crosbie, former director of content development for Freemark, said the company did not have the financial resources to match Juno's aggressive pursuit of "eyeballs," despite having raised $8.5 million in venture capital since forming in 1994.

Juno, a wholly owned subsidiary of Wall Street investment bank D.E. Shaw & Co., has spent about twice as much in operating costs and advertising, including full-page ads in major publications and direct mail.

Despite Freemark's demise, Juno is not bereft of competitors. HotMail Corp. of Sunny-

most popular online-related application.

vale, Calif., last July unveiled a Web-based free E-mail service, which is also supported by advertising.

And USA.NET, a Colorado-based start-up, last month released NetAddress, another advertiser-supported, Web-based free service that offers users a permanent E-mail address.

But Ardei says there's nothing "free" about HotMail and NetAddress.

"You cannot use HotMail and NetAddress without first having Internet access," he said. ■

Netscape tests new tools

By Carol Sliwa
Mountain View, Calif.

Playing Santa to software addicts, Netscape Communications Corp. on Dec. 23 launched a "preview release" of its new Communicator Internet standards-based groupware client and a public beta of its Certificate Server software.

The early Communicator includes: the new Navigator 4.0 browser, featuring more intuitive icons and a task bar for switching to other client components; Messenger HTML-based E-mail, with filtering and search capabilities and support for the Internet Message Access Protocol 4 and Lightweight Directory Access Protocol; Composer Web authoring tool, Collabra group discussion software and Conference component.

But like many test software packages, the Communicator preview release is not feature-complete. Still being worked on are the help menu, customization features, spell checker, mail encryption, calendaring, voice mail, 3270 host access and an auto-administration kit, a Netscape spokeswoman said.

Also, the Communicator pre-

view release is not yet available on all platforms. The test version can be downloaded only for Windows 95 and NT.

Daniel Klaussen, group product manager, said he expects other platforms will follow by

Netscape's SuiteSpot 3.0 server software

	Public beta	Ship date
Calendar 1.0	None*	Dec. '96
Catalog 1.0	July '96	Sept. '96
Certificate 1.0	Dec. '96	Q1 '97
Collabra 3.0	Q1 '97	1st half '97
Directory 1.0	Unix: Not available WinNT: Nov. '96	Oct. '96 Dec. '96
Enterprise 3.0	Q1 '97	Q1 '97
Media 1.0	Nov. '96	Dec. '96
Messaging 3.0	Q1 '97	1st half '97
Proxy 2.5	Oct. '96	Unix: Nov. '96 WinNT: Q1 '97

* Note: Netscape licensed technology from Corporate Software & Technologies of Montreal.

SOURCE: NETSCAPE, MOUNTAIN VIEW, CALIF.

the end of February. Klaussen noted that the company wants more feedback on the user interface so adjustments can be made. The final shipping version is due at the end of the first quarter.

Meanwhile, Netscape released more pieces of its Suite-

Spot 3.0 server line, including the beta version of its software for issuing digital certificates. With the Certificate Server, network managers can generate, revoke, renew and manage X.509v3 public-key certificates to enable mutually authenticated communication between Secure Sockets Layer software.

Netscape last month shipped final versions of its directory server for Windows NT and its media and calendar servers on all major platforms. The calendar server's release came thanks to the licensing of technology from Corporate Software & Technologies of Montreal.

In other recent news, Netscape and Sun Microsystems, Inc., announced they will work together to ensure:

● Sun's Joe object request broker interoperates with Netscape's Open Network Environment.

● Netscape client software supports Sun's WebNFS file system. The companies will jointly promote, license and market WebNFS, the Internet version of Sun's Network File System. ■

Who says who makes the rules?

T he International Ad Hoc Committee (IAHC) looking into the idea of creating additional top-level domain names has now published a draft proposal (www.iahc.org). As one might expect about anything Internet-related, opinion about the draft is mixed.

The idea of forming such an ad hoc committee was first broached in a proposal from Larry Landweber, chair of the Internet Society (ISOC) board of directors; Brian Carpenter, chair of the Internet Architecture Board (IAB); Jon Postel, director of the Internet Assigned Numbers Authority (IANA); and Nick Trio, ISOC Advisory Council officer.

The concept was later expanded by Jon Postel and published as ftp://ds.interrnic.net/internet-drafts/draft-postel-iana-itld-admin-02.txt.

The IAHC was formed after the ISOC board of trustees voted to support the plan in the Postel draft. The IAHC consists of representatives selected by a number of international organizations historically involved in the general types of issues dealt with in the Internet Domain Name System, along with representatives selected by three traditional Internet groups.

The final committee consisted of people chosen by the IAB, the ISOC, the IANA, the U.S. Federal Networking Council, the International Telecommunication Union, the International Trademark Association and the World Intellectual Property Organization.

This diverse group has now made a recommendation to carefully expand the number of generic top-level domains (gTLD) beyond the current three: .com, .org and .net. The proposal calls for the addition of seven new gTLDs, each of which is to be administered by a number of registries working together. The specific new gTLDs to be created will be resolved in the future.

Scott Bradner

The initial registrars for each of these gTLDs are to be chosen by lottery with a fixed number selected from each of seven global geographic areas to minimize the chance of domination by any one country. A $20,000 fee is proposed for those organizations that would like to participate in the lottery to ensure that only financially viable organizations are considered. The fee is refunded if the organization is not selected.
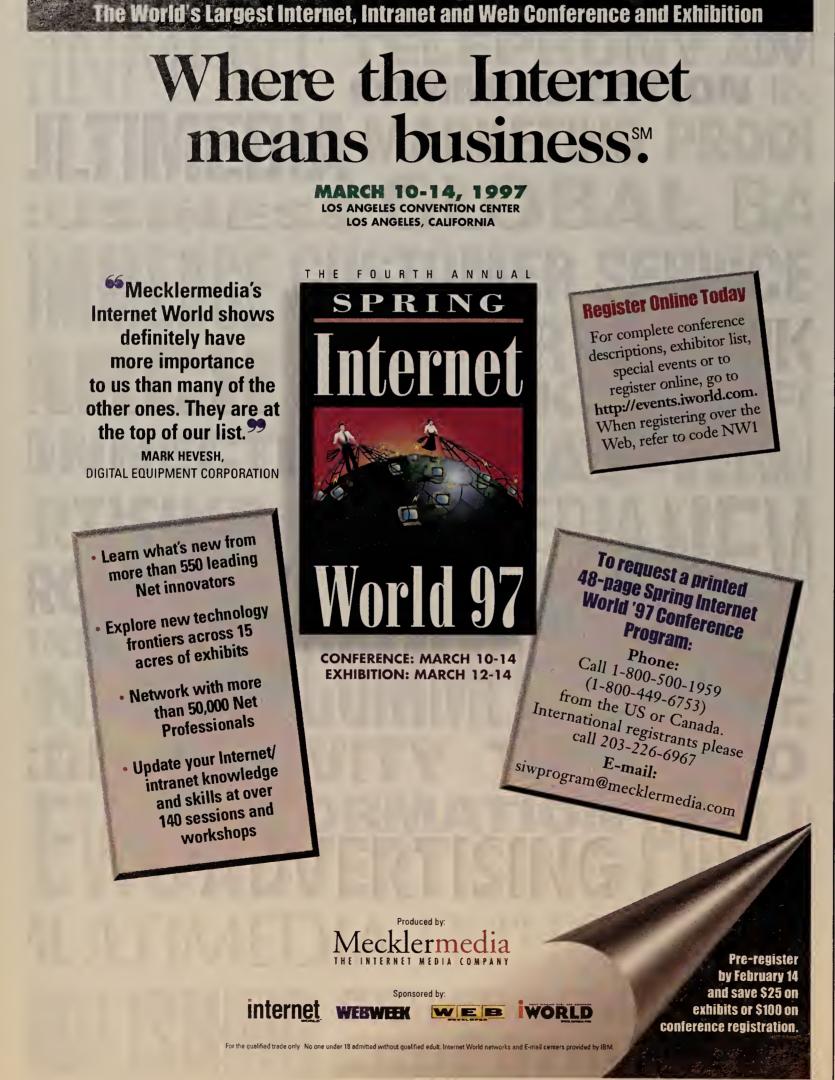
As the Internet proceeds to expand its role in the day-to-day life on this globe, we must soon answer two questions: Who says who makes the rules? And who pays for what?

We cannot find a viable model for answering either of these questions by looking at existing global mechanisms used by telephone, radio or television.

Although there are a few individuals expressing considerable disagreement with the IAHC proposals, and the reception by the traditional international and national regulatory authorities has not yet been made manifest, it just might be that we are on the path toward answering the first of my questions by successful example.

Disclaimer: Since Harvard was not involved in the IAHC, some might question the committee's legitimacy, and yes, I am an ISOC board member, but the above expression of hope is my own.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

Remote access routers get more secure

I am having trouble rebooting a NetWare 3.12 server remotely using RCONSOLE. To reboot the server, I use a file called Reboot. NCF, which executes three commands: Remove DOS, Down and Exit. The file has trouble loading the controller when it restarts the server. It always prompts me for a server name and network number and makes me mount SYS: manually. Do you have any clues why it does this?

Via the Internet

You may have a timing problem since the server asks for the server name and internal IPX network number before you get to the command prompt. This could mean that the drive is not responding in time for it to be recognized by the controller or that the controller itself has a timing problem.

Make sure you have the latest version of the hard disk controller driver. Then issue the Reboot command at the server and watch for an error report when the driver for the controller loads. Verify that you have the latest version of Vrepair, and run it on the SYS: volume. If any errors occur, run Vrepair again until no errors are reported.

You should ask the controller vendor's technical support staff if it is aware of any timing issues between the controller and the file server you use. At one time, for instance, the bus clock settings in Adaptec, Inc.'s EISA controller configuration needed to be reduced to synch up with Hewlett-Packard Co. NetServers.

Ask your file server vendor if it has a BIOS update to apply.

To determine if your problem is related to the motherboard, try putting the controller in a different slot. Watch if the problem manifests itself when you down the server, exit to DOS, then turn the server off and back on. If the problem doesn't reappear, then you probably have some type of timing problem between the file server motherboard and the hard drive controller.

By Robert Koch

The value of providing remote users or business partners access to corporate information cannot be measured, but in this connected world, network intrusion has undeniably become a monkey on many companies' backs.

Firms need to defend their internal nets, Web sites and growing mobile workforces, but many cannot justify spending $20,000 or more for a stand-alone application firewall. Instead, firms rely on vendors to enhance remote access or edge routers with stronger security mechanisms.

By adding more advanced security techniques, low-cost edge solutions can create an effective network defense perimeter while allowing all authorized users to access corporate resources. Extensive filtering capabilities allow network managers to customize and limit the type and direction of traffic that passes through a network.

Many routers enable packet screening based on criteria such as the type of protocol, and the source and destination address fields for a particular type of protocol. These routers can provide a mechanism for controlling the type of network traffic that exists within an enterprise, and the service granted to a user or a workgroup. Services or unauthorized access that may compromise security can be restricted.

This protocol (or service) filtering can be complex, particularly for remote offices that do not have full-time network administrators. As such, suppliers of network security products are beginning to deliver features such as graphical user interface (GUI)-based configuration software and predefined filter tool kits that can be customized with a few simple tweaks.

Line-by-line input

Historically, rules for filtering out potentially high-risk forms of traffic required a network administrator to enter, line by line, each source and destination address and every protocol port number along with a series of potential actions. This can be time-consuming and nerve-rack-

ing because a simple misstep during the firewall configuration could leave the network open to attack. Furthermore, the pace of remote access deployment and new service development routinely violate a firewall's original configuration.
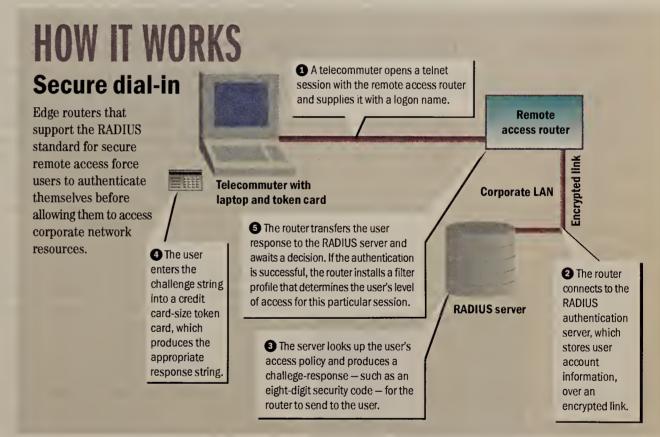
Next-generation firewalls take aim at these issues. Rather than entering complex filtering schemes on a rule-by-rule and line-by-line basis, administrators can establish associations by pointing and clicking through the GUI. Configuration-checking software and other net topology tools can warn of a potential

cation enables network administrators to grant a specific user access to the exact set of applications he or she needs or is authorized to use. This is particularly useful if a user is temporarily away from the office and requires access to enterprise-based resources, or for the growing mobile workforce.

Secure RADIUS

One of the most popular public net authentication services is Remote Authentication Dial-in User Service (RADIUS). Based on industry standards, RADIUS primarily offers centralized veri-

tween the remote user and the RADIUS server, a series of security packets will be exchanged; data such as encrypted password, security code and access privileges indicating what application the user may invoke will be passed. Also, the RADIUS server may pass to the router information such as duration of connection, bandwidth allocation, application access and instructions on when to execute these options for the remote user. Using these features, a series of user profiles and access filters can be established for individual users, workgroups, departments, branch

HOW IT WORKS

Secure dial-in

Edge routers that support the RADIUS standard for secure remote access force users to authenticate themselves before allowing them to access corporate network resources.

❶ A telecommuter opens a telnet session with the remote access router and supplies it with a logon name.

Remote access router

Telecommuter with laptop and token card

Corporate LAN

Encrypted link

❹ The user enters the challenge string into a credit card-size token card, which produces the appropriate response string.

❺ The router transfers the user response to the RADIUS server and awaits a decision. If the authentication is successful, the router installs a filter profile that determines the user's level of access for this particular session.

❷ The router connects to the RADIUS authentication server, which stores user account information, over an encrypted link.

RADIUS server

❸ The server looks up the user's access policy and produces a challenge-response — such as an eight-digit security code — for the router to send to the user.

risky setup, a missing service or a service that is present yet unsecure.

Network monitoring and control tools that investigate and interrogate suspicious activity and stop malicious users before they do any damage will become popular security features. Next-generation firewalls that incorporate a dynamic or stateful operating environment will be the first to integrate and benefit from these new facilities.

Other security measures, such as authentication and privacy enhancements, will strengthen and complement security routers. For example, authenti-

fication and access control for remote dial-in. It simplifies the administration of remote user profiles, passwords, accounting and other security-related requirements by deploying them on a centrally managed authentication server (see graphic).

In a RADIUS-protected environment, the router acts as a screening device by examining the incoming packets and filtering or forwarding them to the authentication server. The RADIUS server initiates a series of challenges to the incoming connection request to validate and identify the user.

During the conversation be-

offices and other locations.

As remote access usage continues to flood the Internet, and corporations begin to exploit public 'Net bandwidth to augment their existing enterprise networks, the concern over security justifiably grows. The combination of a screening router with authentication services on the same remote access solution allows user mobility while maintaining access profiles, passwords and application privileges.

Koch is product marketing director at Proteon, Inc., a remote access router provider in Westborough, Mass.

USWeb's influence grows partner by partner

Having just wrapped up our year-end Power Players issue, the power theme still weighs on my mind, reminding me that I am remiss in not yet writing about USWeb, a company that will have increasing influence over Internet technologies in the future.

USWeb bears watching for a couple reasons: The first is that its business model is innovative and sound. Businesses are trying to figure out how to embrace the Internet and intranets, and most don't have the expertise to handle the projects or the wherewithal to hire a big outsourcer like EDS. To help this vast chunk of corporate America deal with 'Net projects in the $20,000 to $1 million range, USWeb is building a network of affiliates that will provide local Web consulting, development and hosting services.

Since its March launch, USWeb has signed on 32 U.S. affiliates — pretty good progress toward the ultimate goal of between 200 and 300 affiliates around the world.

While the company is building a network of franchisees, USWeb officials don't like the negative connotations of that word. If you want to get a rise out of CEO Joe Firmage, formerly VP of strategic planning for Novell's systems group, or CTO Sheldon Laube, who held the same title at Novell, ask them if they are trying to build the McDonald's of

the Internet. In the company's own words, USWeb is aiming to build "serious, leading-edge Web sites" and won't be creating "cookie-cutter" Web businesses. (Check this out in the "Becoming an Affiliate" area of www.usweb.com.)

USWeb promises customers a consistent level of expertise, service and support. One of the key ways it will help its affiliates achieve that promise is by providing technology assessment services that will help them sort through the bewildering array of new Internet products.

That's the second interesting aspect of USWeb. By defining which Internet products and services its affiliates should employ, it will come to have more and more power over which technologies succeed in the market. As the USWeb network grows, so too will its influence.

Last month, USWeb provided a boost to Microsoft's Internet strategy when it tabbed ActiveX, Active Server and Desktop, and Internet Explorer as "strategic technology platforms." USWeb also has partnerships with Compaq for servers and BBN Planet for hosting.

So if you need help bringing your business online or you want some insights on where to place your technology bets, keep an eye on USWeb. It will succeed based on how well it picks Internet winners.

John Gallant, editor in chief   jgallant@nww.com

Venture over the horizon • *Kevin Fong*

Go corporate: Assemble your own board of directors

As a major shareholder in many public and private companies, I've served on the boards of directors of more than 20 organizations. A board of directors, however, does not have to be restricted to a corporation. Establishing a board of directors for your network operation can yield a number of benefits.

A company's board of directors provides several valuable services. First, it supplies an objective opinion that takes into account the interests of a company's various constituencies. Second, a board provides a perspective that management, focusing on day-to-day operations, may lack. Finally, a board can help with external relationships with customers, vendors and financial entities.

Like a corporation, your network operation has a number of constituencies — users, various departments, upper management and customers. Your board, which should comprise four to eight people, should represent these constituencies.

The board members should feel they can give open, honest and constructive feedback. Pick people with whom you already have good relationships or want to form such relationships. Although it's nice to have good chemistry among the board members, it is also good to have a few opinionated individuals.

Good boards make their members work. Therefore, it's important to select people who have the time and are committed to carrying out specific tasks, such as talking to other departments or company contacts to gain insight into a particular problem your department may be facing.

Young companies for which I serve as a board member meet once a month. This may be too frequent for your situation. Holding meetings less than once a quarter, however, makes it difficult for the board to take a very active role. Meet at least once every other month, and have members work on requisite homework between meetings.

Once the board is created, what kind of work should it tackle? If your board is a cross-section of your user community, it could seek out feedback on the quality and level of service you're providing. Putting together strategic advice, working on team building and per-

forming market analyses are also good uses of a board's time.

Two types of boards I frequently use with the companies I work with are technical advisory boards and customer advisory boards. The primary distinction between these groups and a board of directors is they do not participate as much in business and operational issues. As such, these advisory boards can meet just three or four times a year and still be productive.

If you are most interested in feedback on your service, a customer advisory board would be best. The start-ups I'm involved with are always interested in the marketing feedback we receive from our customer advisory boards — it helps us define our products or services.

The purpose of a technical advisory board is to determine which technologies and trends are on the horizon. A technical advisory board may include people from outside your company or representatives, preferably technical experts, from your favorite vendors. Most vendors would appreciate being asked to participate in these meetings.

Like any meeting, board meetings are most useful when properly organized and managed. Be respectful of the members' time, and keep the agenda moving along. Only spend time on discussions that uniquely leverage your members' background. I've found that meetings lasting any longer than two to three hours strain everyone's attention span.

So get started. Begin by defining the board's charter and criteria for membership. Then recruit the members, develop an agenda and schedule your first meeting.

Fong is a general partner of Mayfield Fund, a venture capital firm based in Menlo Park, Calif. He can be reached via the Internet at kfong@mayfield.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

Tool time

In his column "Data collection is key to making SLAs work for you" (Nov. 11, page 40), Jeffrey Kaplan laments the dearth of adequate network reporting tools, claiming "net managers are unable to generate the solid baseline data necessary." He is obviously unaware of Network Health, a Web-based network reporting and analysis software package from Concord Communications, Inc.

I use Network Health every day to solve service-level agreement (SLA) issues for NYNEX Corp.'s large IP network. The software automatically computes network baselines, enabling me to understand where the network is today

Bet on Cisco to win the WAN switching war

It's clear that 1996 will be remembered as the year the switching wars started. You've been building router-based internetworks for a decade, but expansion in traffic levels and number of users has you looking for faster ways to move traffic between sites. Switching seems like such a strategy, and vendors from Cisco Systems, Inc. to Ipsilon Networks, Inc. have announced their own specific architectures. But which is best?

One problem buyers have in assessing switch vendors is a lack of objective requirements. What is it that switches do that routers don't (besides, well, switch)?

When you move information around in a network, you need some sort of gadget at the places where trunks fan out to steer data in the right direction. To maintain network performance, the gadget has to operate fast enough to keep up with the input-to-output movement. If you assume 500-character datagrams (packets), feeding a T-1 trunk would require moving 384 packets per second. A T-3 trunk would need almost 11,000 packets per second and an OC-3 about 35,000. If you want fast trunks, you need fast gadgets.

What determines the gadget's packet-per-second rating? Basically, it's one divided by the time it takes to move one packet through. So it follows that if we reduce the time required to read in, process and dispatch a packet, we've increased the speed rating of the gadget. Routers make a steering decision at every point where trunks join, looking the address up on a table to find out where a given data packet goes. Switches make a steering decision once, when the data is first handled. After that, switched information moves on virtual connections without address lookup, thus allowing faster network trunks.

What does this have to do with who wins the switching wars? Well, if the objective of switching is to make network information steering fast enough to support high-speed trunks, then your need for it is proportional to the speed of your connections. Superswitch performance levels simply aren't needed inside most corporate networks because routers have packet-per-second ratings high enough to maintain full-link utilization at the trunk speeds users really buy.

This is the beauty of Cisco's tag switching. With the Cisco concept, you make a router behave like a virtual circuit switch without making any significant hardware changes that would increase its cost. That gives you a measure of performance improvement—probably from 15% to 25% in most core network applications. That's probably enough for you to keep up with the wide-area trunks you buy. In other words, the average corporate wide-area network doesn't need superswitches;

it needs only modestly enhanced routers.

Ah, but the qualifier "wide-area" raises an interesting point. On the premises, the only limit in the speed of the trunk is the capital cost difference for the interfaces. That's where corporate America could expect to use switching. OC-3, rare as a panda in the wide area, is as common as dirt on the premises. There's even some OC-12 in corporate premises and campus use. Multiple trunks at this level would quickly outperform even fast routers.

What this means in the competitive market is simple. Cisco alone can win in the wide-area switching war, because Cisco alone can provide the average corporate buyer with the capacity improvement needed at a low upgrade price.

The other approaches, however clever and high performance they may be, just can't be deployed in enough WANs because the cost of transmission will keep trunk speeds constrained. That makes the rest of the architectures campus-and premises-focused.

But how much switching—in the sense of these new router/switch architectures—does the buyer need on a premises or in a campus? Can't they just have really fast workgroups and collapsed backbones to build almost flat networks?

That's a good question. We've focused too much on the wide-area impact of these new switching architectures—outside of Cisco's tag switching, their fit in corporate networks depends on how effectively they return on the buyer's investment for on-premises switching applications with no WAN involved.

To say that this isn't the message the Ipsilons or Cascades of the world are pushing is an understatement. Cascade Communications Corp. doesn't even sell much to end users; IBM handles that end of the market. That puts Cascade's IP Navigator solidly into the Internet service provider space. Ipsilon sells through OEMs, and its success will probably depend on whether any of its partners can tear their eyes off the distant wide-area mountains and look at their own feet rooted on the premises.

Will Ipsilon's IP switching or Cascade's IP Navigator end up connecting premises virtual LANs? Keep that question in mind when you review their features, because it might well be where they end up in your own network.

Nolle is president of CIMI Corp., a technology assessment firm located in Voorhees, N.J. He can be reached at (609) 753-0004 or via the Internet at tnolle@cimicorp.com.

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and quantify historical enterprise network performance. This allows me to set realistic SLA goals and objectives with our users, and document service levels on an ongoing basis. It also allows me to proactively monitor the network and adjust resources as needed.

Today, we have 18 months of data for our network and use a four-week baseline to compare against our thresholds. Not only can we see the performance of our network today, but we can also compare it to our network's performance a year ago.

Recently, Bay Networks, Inc. and Concord Communications presented a seminar on SLAs that addressed many of these concerns. For more information, check out www.baynetworks.com or www.concord.com.
Babak Roushanaee
Managing principal
Enterprise Technology Solu-

tions, Inc.
Needham, Mass.

Bright future for Banyan

Linda Musthaler's column "Banyan's long-range forecast: Cloudy" (Dec. 9, page 41) contained numerous inaccuracies.

Musthaler suggests Banyan Systems, Inc. is having difficulty obtaining business. Actually, we have announced several big wins, including the U.S. Food and Drug Administration and Air National Guard; TV Azteca, the second-largest television broadcast network in Mexico City; and Canada's Department of National Defense.

Contrary to Musthaler's contention, Banyan customers are not abandoning VINES for NT. Actually, some customers have researched and rejected this option of migrating to a pure NT NOS environment. For example, one customer determined the $14 million price tag

did not justify the reduced value it would receive from a pure NT environment.

Instead, many customers are selecting Banyan's StreetTalk for Windows NT, which allows them to integrate NT servers into their existing environments.

Musthaler contends that StreetTalk is useful only on the NT platform. Actually, Banyan will provide StreetTalk on a number of different platforms. Offerings include Universal StreetTalk, which runs on several open Unix platforms as well as NT, and Switchboard, an Internet directory based on StreetTalk.

Musthaler asserts that David Mahoney's resignation is a sign of trouble. In fact, Mahoney's decision was based largely on a desire to signal to the marketplace that Banyan is embarking on significant change. This has been received by customers,

analysts and the press as a positive move by Banyan.

It is an exciting time to be a Banyan customer and employee. Banyan is pursuing several new initiatives that will

enable us to meet the networking needs of our customers.
Eugene Lee
Vice president of marketing
Banyan Systems, Inc.
Westborough, Mass.

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ROCK-SOLID INCENTIVES

*Prudential's Steven Steinberg says his company's bonus plan puts
a premium on training — and retaining — net staffers.*

By Alan Radding

W hen it comes to technically skilled individuals — people in high demand — keeping them can be more frustrating than finding them in the first place. There is a cruel paradox at work. You carefully cultivate your own highly skilled people by providing costly training and experience, only to lose them to a predatory rival that can throw around big bucks to lure away skilled staff.

Smart employees recognize this paradox, and some will play it for all it's worth, which can be considerable. Recruiter Ron May, president of Specific Recruiting, Inc., a technical skills recruiting firm in Chicago, remembers one of his clients took a job in the mid-$30,000 range — about $5,000 less than his market value — because it promised him the opportunity to receive extensive training and hands-on experience in Windows NT, adding to the NetWare skills he already had. A year and a half later, May estimates the employee's value in the market has soared to $55,000.

The employee hasn't made a move yet, but it's questionable whether his current employer can hold on to him for long in the red-hot Windows NT market without giving him a substantial salary increase — on top of the training costs it has already covered.

"This is a frustrating situation for a lot of companies. They need to come up with some kind of lucrative handcuffs," says Martin Harts, a partner in KPMG Canada's Toronto-based Compensation Practice. This, however, is tricky. The handcuffs must be attractive enough to keep employees in place long enough

for the company to receive a payback on its training investment — without throwing the organization's entire salary structure out of kilter.

Moreover, Harts notes, companies don't always have the time it takes to train existing staffers, forcing them to shop around for experienced people and pay whatever the market dictates. Further complicating the problem is the relatively brief life span of many technologies.

In short, you need a strategy to ensure that the advanced skills you're investing in today will be the skills your company needs down the road.

Prudential Insurance Company of America in Newark, N.J., believes it has found such a strategy. Dubbed the Emerging Technology Market Supplement Program, it is designed to ensure that the IS organization cultivates the technical skills Prudential business units will need in the future, while ensuring that its people stick around long enough to use those skills.

Carrots and sticks

With $42 billion in 1995 revenue ($219 billion in assets) and 85,000 employees, Prudential is a leading financial services firm. The company operates four mainframe data centers, 3,000 LANs and employs close to 6,000 IS staff.

Reflecting the changing technology times, however, Prudential is putting emphasis on several key technologies, such as LAN infrastructure management, Windows NT, Internet/intranet, computer-telephone integration, Lotus Development Corp. Notes, data warehousing, and C++ and Smalltalk, reports Steven Steinberg, vice president of distributed computing networks. The Emerging Technology Market Supplement Program targets skill development in these areas through training incentives.

STEVEN BORNS

Training incentive programs take one of two forms — carrot or stick — explains Glenn James, partner at Deloitte & Touche Consulting Group in Atlanta. "Where demand for a skill is high, the company will train people if they make a commitment to stay for a certain period of time," he explains. If they don't stay, they have to pay back part of the agreed-upon value of the training — that's the stick approach. The carrot approach pushes payment of the incentive into the future, requiring that the employee who received advanced training will still be there to receive the reward.

Prudential's Technology Market Supplement Program follows the carrot approach. Under the program, individuals who achieve a specified level of competency in one of the targeted technologies are awarded a bonus, Steinberg explains. The firm also foots the bill for training and provides time for employees to practice the new skills they are learning. "Once they become experts in the technology, we'll pay the bonus the market demands," he says.

The incentive bonus is paid in two installments, six months apart, ensuring that the person hangs around at least that long. "This is outside of the salary structure. We don't adjust the base salary," notes Joann Verderese, Prudential's director of compensation.

In 1995, the first year of the program, Prudential paid Emerging Technology bonuses to about 330 employees. As of press time, Steinberg was expecting even more to qualify for 1996 bonuses.

Prudential won't disclose the size of its bonuses, other than to say they generally amount to several thousand dollars. But consultants suggest a meaningful incentive needs to be $5,000 to $10,000, or about 10% of an employee's salary.

The potential gotcha in programs like this, according to Harts, is determining when someone achieves the necessary level of competency. Unlike programs in which a company pays an employee for earning certification from a third party as proof of skill level — such as Certified Novell Engineer status — the Prudential program is much more vague about when someone has demonstrated expertise.

"These kinds of programs are always subjective, which is a problem," Harts says. "But they work best if half or more of the criteria are quantitative." Where the criteria are soft, and therefore open to interpretation, they should be fully explained.

Subjectivity doesn't appear to be a concern for Prudential management. "We try to avoid setting up too much criteria," Steinberg asserts. Each business group submits to IS the names of people it determines are making significant contributions using various technologies. "The business groups know if the person is critical," he says. A centralized IS department has to concur.

Business group managers also work with IS to decide which skills will be rewarded under the bonus plan in the coming year. "We work with the business groups to identify their strategic needs," Steinberg explains.

This kind of constant evolution keeps the incentives from evolving into expected entitlements, Harts says. "By reviewing the plan each year and keeping it tied to business goals that may change, you communicate that you will reward different skills and behaviors, and the incentives may change."

Employees, however, would like more specifics. "In my case, I knew what management was planning, but in general there need to be more procedures in place so people know who is eligible and what the specific bonus will be," says a Windows NT expert who received the bonus in the first year of the program.

That said, the seven-year Prudential IS veteran agrees the program is a step in the right direction. "The program has been satisfying from my standpoint because it shows that Prudential is starting to address the problem of compensating employees who have highly marketable skills," the NT expert says. The program proved to be a boon for her, adding a sizable kick to her 1996 income. But there is no guarantee she will get a similar incentive again, although nothing in the rules precludes that possibility.

Although she has not been approached by headhunters — and Prudential insisted she remain anonymous for this article in hopes that remains the case — she knows others at Prudential who have. "I am well aware that Windows

UPS likes to promote from within, *says Philip Freyer, which translates into lots of training. Although there are no formal incentives, "training is part of the review process."*

HOT SKILLS

Which skills are in high demand? We checked the number of job openings requiring skills Prudential Insurance deemed most important that were posted in Usenet forums, just one of many places on the Internet where IS jobs are posted.

Skill	Postings (as of 11/26/96)
Internet/intranet	88,015
Unix	86,948
C++	16,381
Windows NT	9,693
Lotus Notes	2,726
Smalltalk	992
Data warehousing*	652
Computer-telephone integration	161

*There were many more postings for various specific DBMS skills.

NT is a hot technology," she says.

Ultimately, she hopes the incentive program represents an interim step until the company permanently revises its salary structure to match industry compensation for individuals trained in high-demand technologies. That, however, is not likely to happen given that avoiding salary restructuring is one of the program's goals.

A rare bird

In an informal survey of compensation consultants, IS recruiters and IS hiring managers around the country, *Network World* found the Prudential program rare and, to some, controversial. "I have heard of similar programs designed to raise skill levels of employees, but they certainly are not commonplace," says Frank Schoff, president of Management Recruiters in Cedar Mountain, N.C.

While advanced skills training represents a powerful employment incentive, analysts say programs such as Prudential's address two weaknesses in conventional training initiatives.

First, when employees come back from training, they often don't apply what they've learned. As a result, they soon lose the new skills, squandering the value of the training. "Here you have a real inducement to add to your skill base," Schoff says.

The second problem is having newly trained people wooed away by other companies. "Now you've got people who may be worth thousands of dollars more on the open market than they are being paid. This closes the gap," Specific Recruiting's May says.

Some managers, however, are incensed at the prospect that their companies would have to provide extra incentives, even in a highly competitive job market, when they are already helping employees enhance their skills. "I wouldn't hire people who didn't want to learn and stay with us," insists Bard White, chief information officer and worldwide

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Other types of creative incentives

Competitive salaries and extensive training programs are only two ways to attract and retain good people.

Another is a cash signing bonus. Typically running between $2,000 and $5,000, this one-time sweetener may help you land an employee, but it won't do much for helping you keep them.

But incentive-based compensation can, according to Michael Babin, general manager at Austin, Texas-based CSW Communications, a subsidiary of the electric utility holding company Central and Southwest Services, Inc. At his company, employees can earn a maximum of about 10% of salary in incentive compensation, based on a series of quantitative and subjective performance measurements.

Flexible hours is another widely used incentive. "Give me a good 40-hour week, and I don't care how you put it in," says Bard White, chief information officer and worldwide director at Spalding Sports Worldwide in Chicopee, Mass.

The opportunity to moonlight is especially popular with network administrators and Internet/intranet people. "A good network person can pick up some serious money doing a few projects on the side," says Ron May, president of Specific Recruiting, Inc., a technical skills recruiting firm in Chicago. And they appreciate it if they don't have to sneak around behind the company's back to do it.

Stock options are a potentially valuable incentive at young, fast-growing firms. Once reserved for managers of fast-track start-ups, top-notch technical people are now increasingly offered options. The idea is you work for a lower weekly paycheck in return for a stake in the future payout when the company goes public or gets acquired.

— *Alan Radding*

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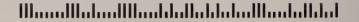
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director at Spalding Sports Worldwide, a Chicopee, Mass.-based sporting goods manufacturer.

White guarantees every IS employee as many as three weeks of technical training each year. Currently, Spalding is building up its Internet know-how through training and skills transfer programs that take advantage of outside experts brought in for short-term assignments. As a result, he boasts of virtually no turnover.

OUTSOURCING IS NO FACTOR

In September, Prudential Insurance signed a five-year, $340 million out-sourcing deal to have IBM's Integrated Systems Solutions Corp. run mainframe data centers. The agreement, which covers legacy systems, will have little effect on Prudential's Emerging Technology Market Supplement Program. "We don't intend to make any significant changes," says Steven Steinberg, vice president of distributed computing networks for the company.

"Salary is not always the highest rated factor when people change jobs," notes Deloitte & Touche's James. While salary never drops below third, factors such as job security and opportunity for training and promotion also rank high. "Ten thousand dollars one way or another won't mean much if you are likely to lose your job," he suggests.

The availability of training, as opposed to financial incentives linked to training, can be a powerful factor in attracting and retaining technical people, insists May. Because technologies constantly change, the opportunity to be continuously exposed to and trained in new technologies is a real source of long-term career value.

That's how Mitch Hadley, vice president of strategic technology at Nations-Bank in Charlotte, N.C., sees it. "Training is like food," he says. "You give people some, but they keep needing to come back for more."

At United Parcel Service of America, Inc., based in Atlanta, the prevailing phi-

losophy is to promote from within whenever possible, according to Philip Freyer, manager of domestic architecture and design. This translates into extensive training — although no formal financial incentives are tied to training.

"Training is part of the review process, and different managers weigh it differently in the overall review decision,"

Freyer says. Progress along a training plan can result in a more positive review and, ultimately, promotion and increased pay.

Although rare now, initiatives such as Prudential's Emerging Technology Market Supplement Program are likely to become more common. "There is a dearth of people with good technical skills, so companies have to enhance the

skills of the people they already have and then keep them," Schoff says. For technical people, this holds the promise of more training and more money. That's like having your cake and eating it, too.

Radding is a freelance writer in Newton, Mass., who specializes in technology. He can be reached at aradding@world.std.com.

See how your company's salary structure stacks up by checking out salary surveys from:
● Matrix, a high-tech placement firm.
● Source EDP, another high-tech recruiter. This firm's site also includes info on career planning, development and case studies.
● The 1996 Network World/Deloitte & Touche Salary Survey.

If you want to risk serious depression, take a look at the San Jose Mercury News annual survey of Silicon Valley executive compensation. Do your vendors deserve to make this much? Enter the number above in the DocFinder box on the home page.

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Briefs

■ **Monarch Bay Software, Inc.** *is shipping a new version of its* **Help Desk Handbook.** *The book is written for those new to operating a help desk, but even veterans can benefit from information about downsizing, outsourcing options, knowledge bases and query languages.*

The book can be downloaded free (helpbook.zip) from Monarch's Web site (www.helptrac. com). It is also bundled at no charge with the free demo of Monarch's HelpTrac for Windows 5.0 help desk software.

Monarch: (713) 450-2800.

■ **Gartner Group, Inc.** *has purchased 40% of* **Fox Industries, Inc.,** *an Internet content provider of business and interactive training systems. Gartner said the move affirms its commitment to further develop its interactive capabilities.*

Gartner: (203) 964-0096.

■ **DKSystems, Inc.** *this month will release* **OnTrack-ATM.Net** *software that training managers can use to create online training information. It is an add-on module for DKSystems OnTrack for Training 4.1 software. Pricing is tentatively set at $8,995 for five concurrent connections.*

DKSystems: (800) 892-5332.

Score one for the taxpayer: IRS assumes burden of proof in contractor disputes

New law makes it easier for you to defend hiring of independent contractors vs. employees.

By Loretta Prencipe

The Internal Revenue Service is giving a break to anyone taken to task for classifying workers as independent contractors instead of employees. Under a rule that went into effect Jan. 1, the IRS must prove you improperly classified someone as an independent contractor to avoid payroll taxes.

Previously, you were responsible for showing an independent contractor passed a 20-point test and could legitimately be classified as such. The IRS merely had to challenge your decision, and you had to jump through complicated legal hoops to make your case — often without knowing why the IRS believed you were off base. More often than not, the IRS prevailed.

Now the IRS must lay out its case first. This can save you untold time and money because you know up front exactly what points you're being challenged on. You can then build your defense more quickly. Sure, the IRS auditor may not buy your case and require you to pay back taxes, penalties and interest. But you can appeal the decision to higher IRS authorities and, eventually, tax court.

The rule change only affects the auditing procedures of the IRS, not your initial classification of workers or the need to keep proper records. Yet the change is an important one when you consider the IRS is expected to continue aggressively auditing businesses on the employee classification issue.

The IRS has seen a lot of managers bend to mounting pressures to classify workers as independent contractors, freelancers or consultants. That pressure can come from managers who want to hire more workers on a per-project basis but avoid the costly overhead of paying taxes, benefits and insurance.

> **GET THE RULES**
>
> The IRS can send you a document that lists 20 points to help you determine whether you can classify someone as an independent contractor. Call (800) 829-3676 and ask for publication 15-A, which also includes other rules to follow.

Likewise, many potential employees willing to work on a per-project basis are pressuring managers to classify them as independent contractors so they can reap their own set of tax benefits.
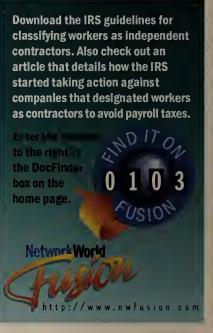
While the rule change benefits you when you're audited, the trick is to avoid an audit in the first place.

A key point to remember is that you only have control over the end result of an independent contractor's work, not how the work gets done. "If you tell someone not only what the end product should be but also how to reach that result, then you have hired an employee," says David Oblong, a partner in Albo and Oblong, LLP, a law firm in Springfield, Va.

You don't even have to exercise control over someone to have that person deemed an employee, according to the IRS. Merely having the right to control the worker is enough for someone to be awarded employee status.

Keeping that in mind, here are some tips for making sure you don't run afoul of IRS rules when classifying someone as an independent contractor.

● Don't give an independent contractor instructions on when, where or how to work. If you must, do so only in general and keep instructions to a minimum.
● Don't pay to train an independent contractor. You've hired this person as an expert. Additional training should not be necessary.
● Don't hire, supervise or pay a contractor's assistants.
● Don't pay separately for the contractor's business or travel expenses. Instead, these costs should be built into the contract.
● Don't restrict the contractor to working only for you. However, take steps to protect your proprietary secrets.
● Require the contractor to maintain a business address that is separate from yours, especially if you give that person office space at your site.

● Have a separate written contract for each job. Clarify in the contract that the contractor is responsible for paying federal and state taxes.
● Get the blessings of your human resources director and legal department before classifying someone as an independent contractor.

With everything else you have to deal with, you don't need worker classification problems, even if the burden of proof is now with the IRS.

Prencipe is an attorney in Springfield, Va., who prefers the gentler art of freelance writing on legal and employment topics. She can be reached at (703) 321-8939 or LWPrencipe@aol.com.

CONFERENCE PLANNING

CONFERENCE: Second Annual Implementation Conference
WHEN: Jan. 20-25
WHERE: San Diego
SPONSOR: The Data Warehousing Institute
CONTACT: (719) 599-4303

There promises to be something for experienced database administrators and neophytes alike at this show, with lots of focus on case studies. Half-day sessions will expose you to the challenges faced by organizations such as MCI Communications Corp., The Chase Manhattan Corp., the Environmental Protection Agency and the Federal National Mortgage Association (Fannie Mae). One- and two-day sessions are scheduled on topics such as data warehouse planning, data mining and business intelligence. Data warehousing tools will be addressed in three full-day workshops.

Conference packages range in price from $1,305 to $2,235.

CONFERENCE: Internet Expo
WHEN: Feb. 17-21
WHERE: San Jose, Calif.
SPONSOR: Digital Consulting, Inc.
CONTACT: (508) 470-3880

This expo has three conferences that target client/server application development, intranet development tools and Internet migration. Web site authors, developers and Webmasters who use Microsoft Corp.'s 'Net tools can also get training. Pre- and post-conference seminars will cover Web authoring and page design, database integration and gathering competitive intelligence.

A three-day conference package costs $1,095. You can add a single pre- or post-conference seminar for $345.

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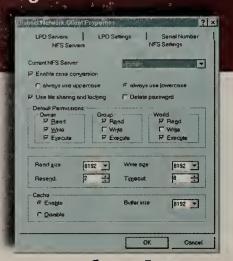
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Netscape

Web browser, you have to take everything that comes with it," said Kevin Redding, manager of Web development for East Hartford, Conn.-based Pratt & Whitney. "We're pretty leery about using all the components of Communicator because they're not all consistent with our strategic directions."

Like so many large companies, Pratt & Whitney already standardized on a mail client. The aircraft engine maker is migrating from Microsoft Mail to

Exchange. And the company also has some Lotus Development Corp. Notes in-house.

Neil Fox, manager of advanced development and applied technology for TRW, Inc. in Cleveland, thinks Netscape is coercing customers into checking out its new components. Fox acknowledges that he would have preferred the opportunity to do a Navigator-only installation. But he's not resentful.

"The rich mail is pretty powerful. It's better than I expected — so much so that it makes me reconsider our E-mail directions," he said.

Fox, like many IS managers, faces a decision. Either he can choose Communicator, stick with his old products (which, in this case, are Novell, Inc.'s GroupWise and CE Software's QuickMail) or use a combination, hoping all of them interoperate effectively. But he worries that duplicate applications may cause confusion for end users.

"These browsers are becoming much more than what they were intended to be," Fox said.

Netscape's 2.02 browser was a 3.2M-byte full installation. With Version 3.01, the typical complete install grew to 5.8M bytes. With Communicator, the full installation is around 9M bytes for the standard version (with the aforementioned four-piece installation, Conference soft-

ware and plug-ins). The professional edition — with calendaring, 3270 host access and an autoadministration kit — is projected at 12M to 15M bytes.

Justify the fat

Netscape has been adding new components, such as mail, into its browser since Version 2.0. But this new, more full-functioning client is intended to go up against groupware stalwarts such as Notes, Microsoft Exchange and Novell's GroupWise.

Four components have been linked for the minimum installation because that is believed to be the "most typical download configuration," said Bob Lisbonne, Netscape's vice president of client marketing.

Product manager Duane

Fields offered a technical explanation, pointing out that the individual components are all HTML-based and, as a result, share a considerable amount of common code.

"We see a noticeable speed increase by having the code available once," he said, claiming the client would be fatter and slower if the components are separated.

But that does not mean Netscape will not consider selling them separately. "We've always been open to the idea," said Mike Homer, Netscape's senior vice president of marketing. "If customers want to buy it that way, and we hear enough of that, we would certainly sell it that way. That's merely a sort of marketing decision." ■

Cisco

high-density ATM uplinks and Cisco's Group Management Protocol for multicasting.

The Catalyst 5002 chassis houses the same switching modules as the 5000. The 5002 also features the same 1.2G bit/sec backplane as the 5000, as well as dual Fast Ethernet uplinks and dual redundant power supplies.

One slot on the 5002 is for a supervisor module, which manages the switch. The other slot houses a 12- or 24-port switched Ethernet, 12-port Fast Ethernet or autosensing 10M/100M bit/sec Ethernet, or 48-port shared-media Ethernet card.

Cisco plans to double the port density of the 10/100 autosensing and 24-port switched Ethernet cards in the future, sources said. Gigabit Ethernet uplinks and multilayer switching are also planned, sources said.

The full-duplex 10/100 autosensing modules make the 5002 optimal for workgroup and server farm applications, sources said, while the fiber-based 12-port Ethernet and Fast Ethernet cards can be used for campus backbone links.

The 5002 forwards one million packets per second and supports four groups of Remote Monitoring diagnostics per port. It also supports up to 1,000 virtual LANs, over 16,000 media access control addresses, per-port priority and quality of service across the backplane, and broadcast suppression, sources said.

One drawback of the 5002 is it is not stackable, observers noted. Cisco seems to be prodding users into purchasing the 5000 or 5500 for higher density requirements.

CARDS FOR THE CATALYST 5002

Current:
- 12-port switched 10/100Base-TX
- 12-port 100Base-FX
- 12-port 100Base-FL
- 24-port switched 10Base-T
- 48-port shared 10Base-T

Future:
- 24-port switched 10/100Base-TX
- 48-port switched 10Base-T

Nonetheless, the 5002 appears to compete with Bay Networks, Inc.'s BayStack 301 and 28200, Cabletron Systems, Inc.'s FN-10 and FN-100, and 3Com Corp.'s SuperStack II Desktop and 1000, as well as LANplex 2500 switches, observers noted. But users said the 5002

also overlaps with some of Cisco's existing Ethernet switches.

"The [Catalyst] 3000 series, I thought, was made for distributing ports out to the workgroups," said Donald Varey, senior network specialist at Great-West Life & Annuity Co. in Englewood, Colo.

"We're using a [Catalyst] 2900, which has a supervisor module and one other module in it," said Bill Meyers, network specialist at Oregon State University in Corvallis, Ore. "It sounds like they just renumbered the 2900."

The Catalyst 2900 is a fixed-configuration 10/100 autosensing Ethernet switch.

Pricing and availability of the 5002 was not available.

Cisco declined to comment. ■

Cisco mulls CIP for StrataCom switches

Cisco Systems, Inc. is considering developing a channel interface processor (CIP) for its StrataCom switches that will connect IBM mainframes to IP and SNA networks without a front-end processor (FEP) or router.

The CIP would route incoming SNA and TCP/IP traffic to SNA- and TCP/IP-based applications on the mainframe. The CIP would also have a TCP/IP off-load feature to let it, instead of the mainframe, handle TCP/IP communications functions.

"We have our engineering team evaluating and doing core work" on a CIP for StrataCom IGX and BPX frame relay and ATM switches, said Cliff Meltzer, vice president and general manager of Cisco's IBM Interworking business unit.

IBM and Cascade recently announced plans to develop a high-speed link between Cascade frame relay and ATM switches and IBM mainframes. This is designed to give Internet and intranet users direct access to mainframe applications without going through intermediate gateway devices such as channel-attached routers and FEPs.

Cisco is also sizing up its Tag Switching technology for establishing SNA class of service and priority, Meltzer said.

"Why not?" he said. "In the sense that Tag Switching is the next level [of routing], those SNA requirements will map to that."

—Jim Duffy and Michael Cooney

Backspin

Yo-ho-ho! Cap'n Gibbs goes to virtual sea to fight piracy

Yo-ho-ho, me hearties. Cap'n Gibbs here. The roughest, toughest, saltiest sea dog to sail the Seven Virtual Seas. So unfurl the sails, brace the mizzenmast and avast behind (nothin' personal, you understand).

"What, pray tell, has brought on this burst of terrible acting?" you may be wondering. The answer is piracy, me buckos, piracy on the high seas of the 'Net.

A few days ago, I got a note from Tracy Specht at White Pine Software, Inc. (www.wpine.com, the folks who sell CU-SeeMe) about an outbreak of piracy.

Mark Gibbs

It turned out a student at MIT had set up an archive of tools that can be used to overcome software copy protection mechanisms — so-called cracks — including one for CU-SeeMe. White Pine was quite justifiably miffed that a) its software had been cracked, b) the crack was publicly available, and c) that the pirate was completely shameless.

I quote from the young man's home page (the use of lowercase, the poor grammar and the strange spellings are all his):

This kind of behavior is intolerable, but any attempt to regulate against it is doomed to failure.

"Cracks this is an assortment of filez that i have gotten from around the web and the usenet, or from friends. i have not created any of these filez, but rather distributor. i am not claiming to be a hacker by any means, but i feel that everyone should benefit from their hard work. keep up the good work, guys! please reload this page as i am constantly adding/moving stuff."

The site contained cracks for more than 45 commercial packages, including Agent99e, Cooledit, CU-SeeMe, Goldwave, HotDog, Internet Phone, Mech-warrior 2, PaintShop Pro, RealAudio, Telix, Thumbs Plus 32 and Winzip.

Authorities at MIT moved swiftly (particularly considering it was over the Christmas break when the site appeared), and the site was shut down. Well done!

Now how much circulation do these cracks get on the 'Net? I fired up my browser and boldly went searching for pirates. My, what you can find with a little creativity.

I first found a site listing 30 or more cracks that went by the name of "Jeff's Dope Ass Crack Page."

Such a nice boy. Such a lot of attitude for a 29-year-old. He should be slapped and sterilized.

Then there's "Ever Blue" (with more cracks than I could be bothered to count), "The New Age Wizard's Cracks" in Denmark (a truly appalling page design, but one wholly appropriate to the loser's nom de guerre: "New Age Wizard" indeed, death is too good for him) and "The Chief's Cracks Page" in Australia (he actually suggests that the cracks are to help you "better evaluate" the software).

But there is also "Warez Page" (run by a 14-year-old who apparently has an obsession with urinal cakes and proclaims, "I'm really into anarchism"), "Crack World Download Page" (whose owner notes which cracks he authored), "The Channel1 File Library: Unprotects" (U.S.), "The Bitter Archive Server" (in Greece, I think) and "Quelques Cracks and Serials" (Canada).

And this wasn't even a serious search. Piracy is a growth business, and if you don't believe the Software Publishers Association's estimate of $13 billion ripped off worldwide in 1995, then just get out on the 'Net and see what's going on.

This kind of behavior is intolerable, but any attempt to regulate against it is doomed to failure.

There are, however, two things that will fix the problem.

The first solution is to have strong software protection that the entire industry backs. The second remedy is making software piracy and the distribution of cracks as shameful as being caught selling heroin.

The place we need to start teaching online ethics is in schools. By the time these people get to our friend Jeff's age, there's no stopping them.

Got a better solution to piracy or a comment about it? If so, drop me a note at mgibbs@ gibbs.com, or give me a call at (800) 622-1108, Ext. 504.

HAIR OF THE INTERNET DOG Like a New Year's Day hangover that has lasted until, well, now, the pain from last summer's Internet stock bust continues to linger in the investment community.

"The IPO market for Internet companies is still not all that good," says **Ullas Naik**, vice president and technology analyst for **First Albany Corp.**, a Boston-based brokerage and investment bank.

After a number of disappointing public offerings in the latter half of '96, public investors are less willing to throw money at any old Internet company that comes down the pike, according to Naik.

Still, he sees '97 as a big year for several 'Net technologies. Naik predicts continued phenomenal growth of intranets, citing a **META Group** study that forecasts spending on intranets to jump from $2 billion in '96 to $24 billion by the year 2000.

Other Naik picks for '97:
● "Push technology is going to be huge. **Marimba, PointCast, BackWeb** — you'll continue to hear a lot about these companies." Naik also says that many companies will start producing value-added components to the packages offered by the big "push" players.
● "Java applications will start becoming more robust in 1997, but the year Java will really take off will be 1998."
● Naik's Fearless Football Forecast: Look for a Dallas Cowboys-New England Patriots Super Bowl.

WE FEEL SO USED An Internet start-up company based in San Francisco has developed filtering software designed to guard against unsolicited E-mail.

Unfortunately, the company in question decided to "prove its point" by spamming E-mail to six million online users.

This is not unlike having a telephone solicitor try to sell you a call-screening device or having some roughneck stub a cigarette out in your face to dramatize your need to sign up for his self-defense course.

To add insult to spam, the company then sent out a press release bragging about its little prank.

We figure the company is operating on the premise that there's no such thing as bad publicity (though Texaco may offer a differing view). However, we will be nobody's patsy. Therefore, the company shall remain unnamed.

Oh, what the hell, it's **Xoom Software** at www.xoom.com.

Now we must take a cleansing shower.

GET THAT THIN CLIENT AN AGENT Less than a year ago, people were laughing at **Oracle Corp.** CEO **Larry Ellison** and his notion of a **network computer (NC).** Then a bunch of companies came up with their own versions of the **NC.**

Now someone has written a novel about the development of a "dumb terminal" and its impact on Silicon Valley. *The First $20 Million is Always the Hardest* by San Francisco-based writer **Po Bronson** is scheduled to be published by Random House in March.

According to Bronson, "the NC paradigm – storing data in the network – seems inevitable." So does a TV movie.

STAY TUNED This Internet-on-your-television stuff must be catching on, too.

FutureNet, Inc., the company that markets a set-top box which allows viewers to access the Internet through their TVs, has signed a deal with National Securities, Inc. for $25 million in convertible securities.

The money will be used to step up product manufacturing to keep pace with demand, according to FutureNet Chairman **Alan Setlin.**

The set-top box, which costs $499, is sold through a multilevel marketing network. FutureNet, a public company, is based in Valencia, Calif.

Fulfill at least one important New Year's resolution and send 'Net Buzz your hottest Internet- and intranet-related news and gossip. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com. And get back on that stairmaster.

ComNet '97

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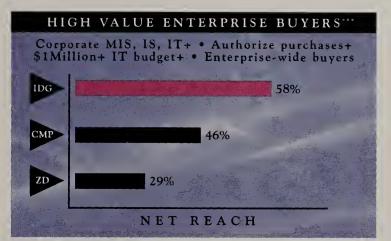That's why EnterpriseWorld is so important.

Only by combining its three flagship news-weeklies could IDG surround and serve the enterprise IS buying process. With Computerworld to cover IS management and strategies. InfoWorld, for en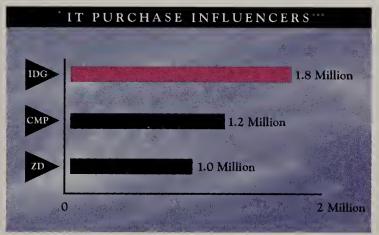ter-prise-wide product evaluation, selection and management. And Network World's enter-prise design, implementation and management of network infrastructures.

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